CHARACTERIZING THE EXPERIENCE OF LONELINESS AMONG YOUNG BLACK MSM AGES 16-29 IN THE CHICAGO UCONNECT COHORT STUDY

by
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ABSTRACT

Problem Statement: From the viewpoint of some the quantity and quality of social relationships are declining, threatening the stability of social interactions. Social connection demonstrates a level of seriousness comparable to other popularly recognized determinants of health and loneliness has been identified as a predictor of several adverse health outcomes. There has been insufficient attention given to loneliness among younger individuals, however, including young Black men who have sexual relationships with men (YBMSM) who are exposed to a complex of structural, social, psychological and health vulnerabilities. The purpose of this study was to explore the generalizability of previous findings on loneliness with older adult populations and establish a characterization of loneliness among this population. A fuller understanding of social connection deficits among YBMSM may potentially inform a more effective public health response for the improvement of their sexual health and overall well-being.

Methods: The dissertation engages a secondary analysis of baseline data from the Chicago uConnect study, a population-based cohort study of YBMSM ages 16-29 years old which measured egocentric sexual and non-sexual social networks in addition to sociodemographic, sexual health and behavior data. Loneliness was measured through a direct measure approach using a single-item measure from the Brief Symptom Inventory-18 (BSI-18). A total of 618 respondents were recruited using Respondent Driven Sampling (RDS) who self-identified as African-American or Black, were assigned male gender at birth, and reported oral or anal sex with a male within the past 24 months. Logistic regression analyses using the generalized estimating equation approach were

conducted to examine the relationship between loneliness and socio-structural correlates reflecting several domains of social stability (Study 1), structural factors of several types of networks of YBMSM (Study 2), and attachment to collective social identities associated with Black and gay communities (Study 3).

Results: Approximately 19% of the sample reported more distressing and bothersome loneliness (problematic loneliness). In adjusted regression analyses, income insufficiency, a college degree, unstable housing, non-partnered relationship status, criminal justice involvement, and self-reported HIV seropositivity were independent predictors of loneliness. Concerning social networks, every additional member of YBMSM's networks (MSM, BMSM, core discussion/emotional support, and sexual partnership) was associated with increased odds of loneliness; however greater density of the emotional support network was marginally associated with reduced loneliness. Lastly, close attachment to Black or gay communities was independently associated with reduced odds of loneliness among YBMSM.

Conclusion: As strategies and interventions to improve the health of YBMSM are developed, our results suggest that interventions could benefit from mobilizing Black and gay group social identities to bolster social connectedness. Having a greater number of network members does not necessarily mean that YBMSM will be less lonely; however, networks in which social support network members know each other embeds YBMSM in a network that potentially protects against loneliness. Additionally, results from this

study corroborate findings that perceived social isolation and objective social isolation may be distinctly different among YBMSM.

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CHAPTER ONE

Introduction

Miguel Garcia Jr, a gay man of color from Detroit, wrote on loneliness in his blog for TheBody.com, which is noted as "one of the web's largest, comprehensive sources of HIV and AIDS information," saying:

> "When I say loneliness, I mean the inevitable feeling of social isolation we experience as we carve out spaces to exist and love within a society still threatened by our presence. Not talking about it keeps us from understanding the toll this experience takes on our mental and physical health….Exploring how our unhealthy behaviors are influenced by loneliness helps unwind our identity from our behaviors…This loneliness, our overwhelming desire to be seen and loved, deeply impacts how we treat our bodies…When I'm lonely and depressed, I'm less likely to refill my medications -- and, yes, to use condoms. These feelings can lead someone who prefers using condoms to have unprotected sex in a room full of them. Traditional HIV prevention efforts ignore that facts mean nothing to someone who's caught "the fuck-its"…[1]"

Situating Social Relationships as a Public Health Issue

Social relationships across the lifespan are important to mental and physical well-being and facilitate secure, safe social environments in which humans survive and thrive [2-3]. Social relationships integrate the individual into their communities, offering a sense of belonging and meaning-making which have implications for the health of individuals within those social contexts [4-5]. From the viewpoint of some, however, the quantity and quality of social relationships is declining in industrialized societies, [see 6-8 for further discussion]—fragmented by contemporary social problems such as the rise of an

increasingly technologically-driven culture, widespread crime, poverty, neighborhood instability, historical legacies of oppression, discrimination and stigma, and even violence, to name a few, all of which threaten the stability of social interactions.

Reported changes in U.S. demography have been cited as evidence of the shift in the structure of social relationships in the United States in recent decades. Oft cited, an analysis of the 2004 General Social Survey (GSS) shows that over the last two decades there has been a three-fold increase in the number of Americans with no confidants (individuals with whom it is presumed one has close ties and discusses important matters/the personal social network) [9]. Additionally, researchers found the modal number of these discussion partners diminished from three to zero individuals, with almost half of the population (43.6%) reporting that they only discuss important matters with either none other or only one other person [9]. A meta-analysis of social network changes across the life span also confirmed that reported personal and friendship networks were smaller in the more recent studies [104]. While these findings have been used to support the claim that people are becoming more socially isolated, this conclusion has been challenged by scholars who have suggested that the study's conclusions result from problematic methods that systematically biased the reporting of fewer alters by respondents [10].

In other evidence, however, results have shown that social networks in the U.S. have become less diverse and are less likely to include non-kin whereas more heterogeneous networks are thought to be associated with less loneliness [11, 26]; as a benefit, non-kin

ties are more likely to offer reciprocity and mutuality compared with kin relationships which may involve more obligation and care responsibilities [12-13]. Additionally, as one example, declining rates of volunteerism—foregrounded in the work of social capital theorist Robert Putnam [8] as described in his analysis in *Bowling Alone*—enables his argument that social disconnection is a defining feature of present-day American realities. Resonant with other contemporary voices, Putnam has concluded that loneliness and the lack of social integration and support is one of the nation's most serious public health challenges [8].

Putnam is not alone in his foreboding of the perils of social disconnection to health. In 2015, the 19th Surgeon General of the United States, Vice Admiral Vivek H. Murthy warned that Americans are "facing an epidemic of loneliness and social isolation" in his 2015 TEDMED talk [14-15]. In an article for the Harvard Business Review he wrote, "We live in the most technologically connected age in the history of civilization, yet rates of loneliness have doubled since the 1980s….,"; he further concluded that once we appreciate the substantial human and economic costs of loneliness, "…we must determine whose responsibility it is to address the problem. But to truly solve loneliness," he adds, "requires the engagement of institutions where people spend the bulk of their time: families, schools, social organizations and the workplace….(p. 4) [16]".

Advocating for the prioritization of social connection as a public health issue, Holt et al. [2] show that research to date has well-demonstrated that social connection demonstrates a level of seriousness comparable to other popularly recognized determinants of health. To

that end, they recommend that enhanced public health surveillance should track indicators of social connection in a systematic way that will increase clarity around the scope of the problem and strengthen the impetus to act.

From a global health perspective, there is increasing attention to the significance of social connections to health. The World Health Organization (WHO) lists "social support networks as a determinant of health" [17] whereas Holt-Lunstad et al. [2] have highlighted the absence of social relationships from the lists of currently accepted determinants of health for most U.S. government agencies, health care providers and associations, and public or private health care funders. As further evidence of the significant link between social relationships and health, the United Kingdom's parliament established loneliness as a health priority and appointed a "minister of loneliness" to address the social and health issues caused by social isolation experienced among the elderly, care-givers, the bereaved, and other vulnerable populations [18].

Emile Durkheim (1858-1917), an early and significant influential contributor to the body of evidence which attests to the relationship between society and health, demonstrated early on in his study of differing suicide rates among religious groups and their levels of social integration that individual pathology not only arises out of psychological processes. Rather, he theorized, it exists as a function of social dynamics he described as a "pattern of social facts" [19]. Umberson [20] more contemporarily furthered this insight by noting: "Social conditions associated with systems of stratification foster opportunities for forming and sustaining social relationships, as well as imposing constraints, obligations, and risks

in relationships (p. 405)." Taken together, these insights point to possibilities for sociological and psychosocial exploration of the relation of social connections to well-being. Having determined that human sociality manifests in contexts of social stratification and other social conditions [21] alongside the acknowledgement that the health of those relationships affects the "quality of our existence [7]", these perspectives have prompted among some a call for increased attention in public health to more seriously regard social connections and social integration as critical upstream and downstream determinants of health [2, 19].

Defining Loneliness

Social connectedness is an organizing construct used to characterize the multiple levels and aspects of social relationships; as individuals appraise their social relationships, a lack of feeling socially connected may be experienced as feelings of loneliness [22-24]. Loneliness or perceived social isolation is a subjective measure of social connectedness that describes the extent to which individuals *feel* socially isolated or disconnected due to a discrepancy between their desired and actual access to the quantity and quality of social ties [22-23].

As an important distinction, research suggests concepts such as aloneness, solitude, and objective social isolation are conceptually different from loneliness [22, 24-26]. For example, having fewer social contacts, infrequent contact, or choosing to be alone in times of solitude do not necessarily result in loneliness, as not all people with small social networks or few contacts experience loneliness [3]. Neither is mere contact or the presence

of significant others in one's life thought to be sufficient in and of itself to satisfy belongingness needs and reduce loneliness [3, 27]. Additionally, there is evidence that objective social isolation, which is typically measured as living alone, fewer social network ties and more infrequent social contact, potentially exerts differential impacts upon health in comparison with loneliness [3, 28]. Rather loneliness is subjectively experienced as the negative emotional state that results when a person perceives inadequacy in the fulfillment of desired intimacy for social relationship(s) [22-23]. It is also worth noting that the literature distinguishes loneliness from depression; while loneliness can be a symptom of and risk factor for depression, evidence suggests they are conceptually distinct—albeit analyses have shown that loneliness can both affect and be affected by depressive symptoms over time [3, 29-31]

Tzouvara, Papdopoulos and Randhawa [32] in their review of the theoretical foundations of loneliness discuss the complex and multidimensional nature of loneliness described in the literature; they acknowledge, however, the need for more conceptual and theoretical work to establish a universal definition of loneliness across different social and cultural contexts. One conceptualization of loneliness that seems to reflect a general synthesis of several definitions has been offered by Perlman and Pelau [33] which describes loneliness as the "…unpleasant experience [emotion] that occurs when a person's network of social relationship is deficient in some important way, either quantitatively or qualitatively." There is an ongoing debate as to whether the construct of loneliness is unidimensional or multidimensional and domain specific, according to Weiss' typology of loneliness, as emotional (loneliness due to the absence of close emotional attachments) and social

(loneliness that results from the absence of feeling integrated in broader social structures) [32, 34]. There is evidence that emotional and social dimensions of loneliness (emotional and social loneliness) manifest as distinctly different constructs within the loneliness experience [35], which has implications for measurement.

Theoretical Approaches to Loneliness

There are several theoretical approaches to understanding how loneliness manifests [33]. The interactionist theoretical approach explains loneliness as multidimensional (i.e. emotional and social) and resulting from the lack of emotional connections that meet basic needs for intimate relationships; essentially, the absence of an intimate figure creates an emotional void [32,36]. The psychodynamic approach emphasizes deficits acquired in infancy or during childhood in making early close attachments which leads to loneliness later in life. [32, 37]. The existential theoretical approach grounds the experience of loneliness as an unavoidable, existential condition of the human experience by which loneliness manifests as the anxious response consequent to attempts at avoiding the existential realization that humans ultimately have a lonely existence [32, 37]. The cognitive approach highlights the significance of cognitive processes and perceptions as foundational to the experience of loneliness, and therefore alleviation of loneliness requires fixing one's cognitions [32-33, 38]. Irrespective of the multiplicity of approaches, contemporary conceptualizations of loneliness seem to reflect either a cognitive/affective or integrative theoretical orientation [38]. More importantly, however, the multiple conceptualizations and corresponding measurements of loneliness potentially are barriers to its public health prioritization and systematic study [2].

A more recent theory regarding loneliness is referred to as the evolutionary theory of loneliness (ETL) [39-40]. Studies using fMRI and animal models have provided evidence that the brain translates loneliness into pain sensations through the same neural pathways activated in the brain when there is physical pain, hunger, and thirst. In the case of social relationships, the pain signal is intended to motivate social reconnection [39]. ETL posits that the aversive emotional pain of loneliness acts as an alarm signaling an imminent threat to important social connections necessary for survival and vital to social trust, group cohesiveness and collective action [40]. As a mechanism that helps ensure survival, loneliness is therefore conceptualized as having had an important role in the evolution of human beings and their survival [41-43]. An additional feature of the evolutionary model contends that despite motivating a desire for social reconnection, loneliness also harbors an inclination for self-protection which is expressed through increased negative affect and hyper-surveillance of the social world for threats to survival [44]. Consequently, that hypervigilance obscures reaffiliation intentions by engaging the lonely in heightened social monitoring and hypersensitivity to perceived social cues which gives rise to negative social interactions including withdrawal from and avoidance of social relations in a self-protective response [45]. One might deduce, then, that loneliness may become a risk factor for negative health related outcomes due to a persistent and chronic overactivation of the biological stress response (hypervigilance). More on the relationship between health and loneliness will be discussed in a later section of this chapter.

Measuring Loneliness

Measures of loneliness generally fall within two approaches: direct versus indirect approaches [46]. The direct approach typically involves the use of a single self-reported item that directly asks respondents whether they have felt lonely/loneliness within a certain time frame. This approach is deemed to have face validity [47] and has largely been used in past loneliness studies [46-48]. The most widely noted critiques of the direct measurement approach include: (1) the notion that admitting loneliness can be socially stigmatizing which could lead to a bias that underreports loneliness, (2) and that respondents may have unawareness of their loneliness as those feelings may not be recognizably identified as such; (3) the problem of establishing reliability with single-item measures, and (4) use of iterations of single-item measures makes cross-study comparisons difficult [46]. When considering study feasibility and the benefit of shorter survey lengths while collecting high quality data, it has been suggested that single measures of loneliness can be reliable for establishing prevalence within a population and highly useful in clinical settings due to its easier administration [49-50].

As an alternative approach, an indirect approach to measuring loneliness involves the use of multiple-item scales which typically avoid using the word 'lonely/loneliness'. The most widely used measure and considered the gold standard measure in loneliness research is the Revised UCLA Loneliness Scale (R-UCLA) which consists of items related to the subjective appraisal of one's social relationships [51-53]. The R-UCLA scale of loneliness is a 20-item, self-report scale that has demonstrated good psychometric properties including internal consistency, test-retest reliability, convergent and divergent validity and construct validity [54]. Used less often than the R-UCLA scales, the De Jong Gierveld

Loneliness Scale [55] and the Social Emotional Loneliness Scale for Adults [SELSA; 56] formulate items based on Weiss' multidimensional typology of loneliness into emotional and social domains; the SELSA further distinguishes emotional loneliness into two domains: family emotional loneliness and romantic emotional loneliness. A review of the literature indicates that there are shorter versions of these scales whose psychometric properties have also been analyzed. Comparison of the direct and indirect measurement approaches has shown that these two approaches may differently identify the prevalence of loneliness, correlates of loneliness as well as offer inconsistent characterizations of the lonely [46]. The authors of a comparative analysis of the different approaches endorse the use of higher cut-off scores to identify the lonely which results in worse sensitivity, but better specificity [46].

Estimating the Prevalence of Loneliness

Though everyone may experience some degree of loneliness at some point in their lives, it is estimated that loneliness is experienced more intensely by as many as 15-30% of the general population [41]. In a recent study that measured loneliness using a three-item scale, a 20% prevalence of loneliness was found among adult patients from 16 primary care practices [57]. A survey conducted by Cigna in 2018 with more than 20,000 U.S. adults 18 years and older reported that 46-47% of Americans sometimes or always felt alone, isolated or left out; also, 18-22 year old respondents reported more loneliness and worse health than older adults who were 52 years old and older [58]. In a nationally representative sample of older adults in the U. S. (aged 57-85) followed over 5 years, at baseline 30% of the sample was lonely, and by wave 2 15% of the sample became lonely, 12% recovered

from loneliness, and 18% were consistently lonely across the two waves [100]. Reliable prevalence estimates, however, are not well described in the literature because of the absence of a singular national statistical indicator or universal measure of loneliness making comparisons across studies and populations difficult as well.

Loneliness is thought to be prevalent in the first two decades of life [30] with peaks occurring between the ages of 15 to 30-years old and among those aged over 65 years—suggesting loneliness has a U-shaped relationship with age [59-60]. Yet, loneliness is most studied in older adult populations [51] with insufficient attention given to loneliness among younger individuals as well as other vulnerable communities that have experienced a legacy of social oppression such as racial/ethnic minorities, and sexual minorities [61]. Broadly missing from the literature are loneliness prevalence estimates of populations other than older adults who experience heightened vulnerability and marginalization accompanied by health disparities such as young, sexual and racial minorities.

YBMSM as Socially At-Risk for Loneliness

Providing an incredibly significant commentary based on their systematic literature review and content analysis of health-focused research on YBMSM, Wade and Harper [102] attest to the paucity of research addressing the psychosocial functioning of YBMSM, including topics of suicide and the nexus of social identity and health; this neglect stands in stark contrast to the prodigious amount of studies pertaining to their sexual risk behavior [102]. While studies related to loneliness have been conducted among older LGB adults [80-83], there are fewer studies exclusively with MSM populations and a dearth of studies

examining loneliness among YBMSM beyond an association with sexual risk behavior and HIV/STI outcomes. Estimating the prevalence of loneliness among MSM recruited through venue-based sampling, an unpublished analysis of MSM (approximately 60% of the sample were BMSM) surveyed in the 2014 CDC National HIV Behavioral Surveillance Survey in Baltimore, Maryland (n=427), using a single-item measure from the Center for Epidemiologic Studies Depression Scale (CES=D) identified 27% of MSM reported over the last seven days experiencing loneliness 1-2 days, 27% reported having felt lonely from a range of 3-7 days, and 11-12% reported the most chronic experience of loneliness at 5-7 days/week [79].

Though research is sparse, we can easily anticipate that loneliness is of concern for YBMSM as they are impacted by social vulnerabilities resulting from holding multiple intersecting marginalized identities all of which are suspected to interact in ways that facilitate health inequity [84]. The complex of structural, social, psychological and biological factors BMSM face create a social context that places the health and social well-being of young Black MSM at higher risk for poor mental and sexual health outcomes [84]. Indicatively, current estimates predict that 1 in 2 black MSM will be diagnosed with HIV in his lifetime [85]—a rate that is disproportionately higher than other racial and sexual minorities. Additionally, multiple social determinants of health affecting young Black men such as fewer educational and job opportunities, poverty, stigma, homophobia, and disproportionate incarceration rates are likely the culprits of sexual health disparities and the barrier to preventive health care access among YBMSM [101].

Using as a theoretical framework to investigate this disparity, the *syndemics framework* takes into account the multiple interrelated and dynamic complex of factors that contribute to heightened vulnerability within marginalized communities which contribute to a higher burden of disease in a given population [86]. Clusters of syndemic-related factors accompanied by experiences of victimization and bullying that arise early in the lives of adolescent YMSM have been associated with poorer health outcomes—specifically, serious suicide attempts, when compared with young men who have sex with women [103]. Giving place to social relationships contributing to the complex of factors in the co-production of excess disease burden, syndemic theory implicates "harmful social conditions and injurious social connections" in sustained epidemics [86]. Thus, gaining a fuller understanding of social connection deficits among YBMSM may provide insight as to their disproportionate vulnerability to poorer health outcomes, the more pressing of them being HIV; moreover, this insight could inform a more effective public health response for the improvement of their sexual health and well-being.

The Relationship Between Loneliness & Health

Loneliness has been found to be a significant predictor of several adverse health outcomes and poor well-being independent of other risk factors [62-64] such as depression [29-30, 65]. With evidence from a meta-analysis, Holt-Lunstad, Smith, Baker, Harris, and Stephenson [6] demonstrated the link between social connectedness and health across 148 studies involving primarily older adults by which an estimated 50% increase in odds of survival over a 7.5 year follow-up was found among the more socially connected. Evidence from a different meta-analysis indicated that loneliness increased the likelihood

of all-cause mortality by 26% over an average of 7 years exceeding the mortality risk of physical inactivity, obesity, and air pollution and carrying a similar mortality risk as smoking 15 cigarettes a day [28].

Aspects of emotional and cognitive health are also susceptible to the impact of loneliness on psychosocial health and well-being [30] such as suicidal behaviors [66] increased depressive symptoms [67-68] and diminished executive control [69] and cognitive decline in later life [70-71]. In a review of observational studies with majority adolescent and young adult samples, loneliness was strongly associated with suicidal outcomes, with a particular impact on higher suicidal ideation and suicide attempts [72]. Both loneliness and social isolation are associated with poorer health behaviors including poor self-regulation [73-75], reduced physical activity [73], and obesity and alcohol abuse [74, 76].

The primary pathways by which loneliness exerts its impact on health are through its influence on health behaviors, the physiological stress response, disruption of restorative and reparative physiological functioning [77] and the availability of resources through social networks which ultimately determine access to opportunities, resources and health promoting influences on behavior [19].

Loneliness and Social Networks

Taken together, the evidence suggests that social connectedness shapes interpersonal and intrapersonal dynamics through one's social networks to ultimately alter health-relevant physiological processes, and provide a context for health behaviors [2, 78]. Loneliness is

a subjective evaluation of ties within one's social networks thus warranting an investigation that identifies features of the social network that might be associated with loneliness. One of the assumptions of social network theory is that individual behavior and attitudes are influenced and determined by aspects of quality, function, and structure of network ties. Moreover, networks condition the flow of resources that ultimately determine access to opportunities, resources, and behavior [87-88]. In addition to resource accessibility, individuals are likely to be influenced by their position in and the overall structure of the network, and not least of all the context surrounding those social interactions [89].

There is evidence linking the experience of loneliness with characteristics of the social network through measures of their structure, quality and function [90-91], and findings support that social network analysis can offer a useful way to understand loneliness [95]. For example, differentiated by age, closeness to members of one's network has been found to be a significant correlate of social loneliness for older adults (quality of the network) whereas size of social network has been identified as a significant correlate of loneliness among young adults (structural component of the network) [35]. Additional evidence suggests that loneliness is associated with frequency of contact and meaningful interaction with social contacts in one's network [35, 92], relatively smaller network size and smaller social support networks [35, 93], poorer quality of social interactions [35], and perceived lack of social support and acceptance [94]. Overall, the subjective characterization of network ties has been found to modulate the effect of the social network on well-being [96] as social ties within networks shape access to and mobilization of the flow of resources. Thus, it is possible that individuals who experience more loneliness, and by extension,

those who experience difficulty maintaining the quality and quantity of their social ties may have less access to and limited benefits from social resources [97]. The studies of this dissertation characterize loneliness among YBMSM particularly in the context of their social networks as there is an absence of literature that explores these aspects related to loneliness; ultimately, these studies aim to fill that gap.

Overview of Study

This study is a secondary analysis of baseline data from the uConnect cohort study (2013-2016), a population-based longitudinal cohort study over 18 months of young Black MSM (YBMSM) ages 16-29 years old in Chicago. The study premiered the use of name generators and interpreters to measure egocentric sexual and non-sexual social networks to learn how these networks affect men's beliefs, attitudes and behaviors as well as physical and mental health related risks for sexually transmitted infections including HIV/AIDS. The overall goal of the analyses contained within these manuscripts is ultimately to contribute a widely missing characterization of loneliness among this population to the literature. To that end, the following manuscripts in this study examine: the prevalence of loneliness among YBMSM and the relationship between loneliness and socio-structural factors, as an opportunity to understand the social patterning of social and economic factors contributing to perceptions of social isolation (Chapter 3, Study 1); the relationship of loneliness with structural elements of their ego-centric sexual and non-sexual social networks is examined inclusive of MSM networks, sexual partnership networks, and their core discussion/emotional support network to understand how structural network factors are related to loneliness among YBMSM (Chapter 4, Study 2); how close attachment to marginalized group social identities is related to perceptions of loneliness, as the extent to

which group or macro-level relations is related to the experience of loneliness among YBMSM is scantly explored in the literature (Chapter 5, Study 3). To support the characterization of loneliness among YBMSM, the study engages the following research questions (RQ):

Study 1/RQ 1 (Chapter 3): What is the prevalence of feelings of loneliness among YBMSM in this cohort of YBMSM ages 16-29? To what extent are socio-structural factors associated with increased loneliness among YBMSM?

Study 2/RQ 2 (Chapter 4): Are structural factors of the YBMSM sexual and non-sexual social networks associated with feelings of loneliness?

Study 3/RQ 3 (Chapter 5): To what extent is a subjective sense of close attachment to collective social identities of racial and sexual identity (Black community & gay community) associated with feelings of loneliness among YBMSM?

Conceptual Framework of the Study

The conceptual framework in Figure 1 is useful for conceptualizing the aims of this study while depicting a relationship between the constructs that are explored. The framework integrates theoretical perspectives culled from existing studies of loneliness among mostly older adult populations for use as a template to understand loneliness among YBMSM. Explicitly missing from the framework, though not a foregone element, is the notion that the loneliness is likely contextualized by the population's unique experiences within an

urban context, of racial, social and economic inequity, the stigma of sexuality and gender non-conformity in addition to other assaults to dignity encountered by marginalized populations. Not least of all, relevant to the framework is an acknowledgement of the critically important ways the HIV epidemic has conditioned social relations among Black MSM.

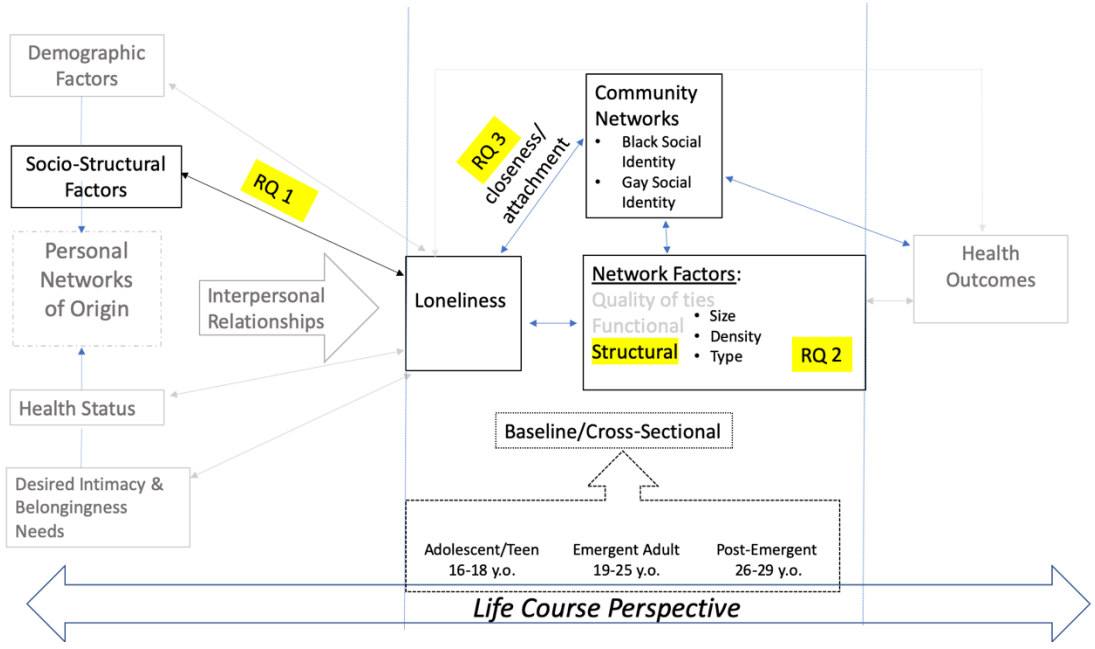
This framework is motivated by the model described by Berkman et al. [87] and modified in studies of loneliness and social isolation by Hawkley et al. [98]. An integration of Hawkley and Berkman's perspectives portrays how distal factors such as demographic factors (i.e. age, race/ethnicity, gender) and socio-structural conditions (i.e. culture, socioeconomic factors, policy, and social context) filter down to more proximal factors such as those directly associated with social networks i.e., size and quality of ties which Hawkley et al. identify as the "ultimate arbiters" of the influence of more distal factors [98]. It is thought that loneliness then conditions important psychosocial mechanisms mobilized by social networks (i.e., social support, social influence, social engagement, type of personal contact, and access to resources) which ultimately influence health outcomes through behavioral, psychological, and physiological pathways [87, 98].

Concerning the examination of associations between loneliness and structural aspects of the social networks of YBMSM, the study is guided by a particular perspective advanced by Cacioppo et al. [99] from which they conclude that loneliness is potentially both a cause and consequence of social disconnection that is experienced affectively and manifested within network structure and function. Thus, this framework allows that loneliness can

result in configurations that suppress the capacity of networks to provide health benefits while the social network structure and function could potentially facilitate perceptions of social isolation that influence health outcomes.

Additionally, it should be noted that while the framework implies the contribution of loneliness and networks to health behaviors and outcomes, these outcomes are not directly studied in this study although the analyses contained therein reference literature alluding to potential health impacts found in other studies. Stopping short of associating loneliness with health outcomes, these studies seek to ground an understanding of the associated factors among YBMSM, as there is very little research that has done so especially beyond an individual level of analysis. To that end, the study also seeks to situate correlates of loneliness among this population as a preface to future research that might more explicitly link health outcomes with social well-being across the life-course of YBMSM, and thereby potentially inform the development and enhancement of interventions used among this population to improve social connection and social well-being.

Figure 1-1. Conceptual framework for the dissertation



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CHAPTER TWO

Methods

Setting

The data used in this study were collected from June 2013 to July 2014 as the baseline wave of the uConnect study which is a longitudinal study of YBMSM aged 16-29 in Chicago, Illinois; the longitudinal study was conducted over 18 months, inclusive of three assessment periods separated by 9 months from the baseline measures. The goal of the uConnect cohort study was to examine aspects of young Black MSMs' social networks most amenable to bio-behavioral intervention. The survey to which participants responded was designed to assess men's beliefs, attitudes, behaviors and physical and mental health related to risk for sexually transmitted infections including HIV/AIDS and to examine the relationship of those factors to sexual and non-sexual social networks. Baseline measurements for the study included data from a total of 618 YBMSM from the South Side of Chicago which is known as the largest contiguous Black urban community in the United States [1] with an age-adjusted mortality rate that is 35% higher than other areas of Chicago and 25% higher than the nation's mortality rate [2].

A diverse group of about twenty organizations that interface with YBMSM was invited to a meeting to discuss the objectives and importance of the study. Each attendee was then asked to nominate three YBMSM who were *socially active* in the community and likely to bring others like themselves into the study, which resulted in a diverse group of 62 seeds recruited from twenty community partners from: the House/Ball community, online communities, community organizers, youth dance groups, Black fraternities, college campuses, gay families, those involved in sex work industry, gym-based settings, church,

clinics, and support groups. The study protocol was approved by the Institutional Review Board of NORC at the University of Chicago.

Eligibility

Using Respondent Driven Sampling (RDS) [3] each seed and subsequent recruits were given six coupons each printed with a unique ID number and invited to recruit other YBMSM into the study. Respondents were recruited between June 2013 and July 2014. Eligibility criteria included 1) self-identified as African American or Black, 2) assigned male gender at birth, 3) between the ages of 16 and 29, 4) reported having had oral or anal sex with a male within the past 24 months, and 5) were willing and able to provide informed consent at the time of the study visit. Each respondent was offered $60 for participation in the interview and was informed that for each additional recruit who participated they would receive an additional $20. Of the 62 seeds recruited, 37 successfully recruited at least one additional person; referral chains had a maximum length of 13 and a median of 3.

Survey

The survey design and instrument were developed over a year by a multi-disciplinary team of public health and social science researchers. The survey instrument obtained sociodemographic, sexual health, and behavior data through the following measures:

Loneliness

Loneliness was measured using a single-item from the Brief Symptom Inventory 18 (BSI-18) [4] which is an 18-item shortened version of the 53-item Brief Symptom Inventory. It

was developed as a screen for psychological symptoms for individuals in medical and community settings to identify individuals with high-risk for clinical mental health diagnoses.

Loneliness measure:

The BSI Instructions Read: "Below is a list of problems people sometimes have. Read each one carefully and mark the choice that best describes **how much that problem has distressed or bothered you during the past 7 days, including today."**

For the item "Feeling lonely," responses on a five-point Likert scale include "not at all,"; "a little bit," "moderately," "quite a bit," and "extremely." The analytical cut point used to define the variable was determined based on the review of previous studies use of the single item measure and the frequency distribution of responses to the item in this sample. Previous studies have used cutoffs that include responses from moderate to the most extreme to define the loneliness variable. To increase specificity, moderate responses were excluded from the loneliness group; those reporting feelings of loneliness that were extremely or quite a bit distressing or bothersome were referred to as the *problematic loneliness* group.

Socio-structural factors

Sexual & Gender Identity

Respondents were given several options from which to choose in response to the following questions: *Gender identity*: (1) Do you consider yourself to be transgender? Responses

were coded as yes or no. *Sexual Identity*: (2) Do you consider yourself to be gay, straight, bisexual, or something else?

Relationship Status

To assess relationship status, respondents were asked: "What is your current relationship status? Are you in a relationship with a man? In a relationship with a woman? In a relationship with a transgender woman? Not in a relationship? Other? The variable was collapsed into a binary variable which described those who responded "yes" to any of the options of 'in a relationship' vs not in a relationship.

Income Insufficiency

Respondents were asked, "In the last 6 months, how often was there not enough money in the household for rent, food, or utilities (for example gas, electric, phone)?" Responses included: never, once in a while, and very often (fairly often and very often were collapsed into one category response).

Employment Status

Respondents were asked: "Are you currently working full time, part time, or not employed?" Options for response included (full time 30 hrs or more/wk, part-time (less than 30 hours/wk), and not employed). The item was collapsed into a binary of employed or not employed.

Residential Stability

Respondents indicated how many places they had lived in the past 12 months. The variable was transformed into a binary variable which included the responses: have only lived one place vs. 2 or more in the past 12 months.

Student Status & Educational Attainment

Respondents were asked about their student status (full time, part time, not a student) and they were also asked about the highest level of school or highest degree, certificate or license attained. The variable was transformed to a categorical variable which included: (1) high school degree/GED or less; (2) some college (no degree) and (3) Associates degree, technical/vocational license, bachelor's degree or higher.

Mental Health

The BSI-18 was used to assess mental health status. The sum score reflects a 'Global Severity Index' for which higher numbers reflect greater psychological distress [4-5]. Participants were presented with a "list of problems people sometimes have" and were instructed to mark the choice that best describes how much that problem has distressed or bothered them during the past 7 days. Scores were summed and converted to T-scores; T-scores greater than or equal to 63 were used as the clinical cut-off score to indicate significant distress per the scale's scoring guidance [4-5].

Self-reported HIV Status

Respondents' self-reported HIV status was elicited with the item- Have you ever been diagnosed with HIV? The variable response was coded as "yes" or "no."

Criminal Justice Involvement (CJI)

Respondents were asked if they had ever been detained, arrested, or spent time in jail or prison. Variable response was coded as "yes" or "no."

The survey instrument also included two separate network generators: an egocentric social (non-sexual) network which will be referred to as the confidant network and a sexual partnership network which rostered respondents' sexual partners in the last six months. Name interpreters were asked regarding the first five confidants and first five sexual partnership network members that were listed. A face-to-face interview was employed because of the heavy cognitive demand of the network enumerations. Computer assisted Personal Interviewing (CAPI) implementation was used by respondents to explicitly confirm matches between "alters" listed in the two network generators used in the survey and confirm alter-alter connections. The confidant and sexual partnership generators and interpreter in addition to the confirming CAPI implementation were approaches modeled after the protocol used in the National Health, Social Life and Aging Project (NSHAP) [6] & National Health and Social Life Survey [7].

Core Discussion/Confidant Network Generator

The confidant network was comprised of up to five close others with whom the respondent felt they could talk about things in life or personal concerns deemed important to them. Research studies frequently use name generators of up to five network members for

egocentric network surveys [8]. The confidant network generator was administered at the beginning of the interview with the following prompt:

> "In this next section, we will discuss your close social network, that is, the people with whom you discuss things that are important to you. So I can ask some follow-up questions, please list the names of the people with whom you discuss things that are important to you."

If the respondent was reluctant to disclose the actual name or full name, they were invited to use initials, a first name, or nickname. Also, if fewer than five confidants were named or the respondent appeared to have difficulty naming anyone, the interviewer asked:

> "Who else should I add? Please think back to the last time or two you talked with a friend or relative or partner about important things in your life or about personal concerns. Are any of them people you have not yet listed?"

Sexual Partnership Network Generator

The sexual partnership generator was administered midway through the interview for which data on up to six sexual partners were collected. Respondents were given the following instructions:

> "Now I am going to be asking some questions about your sexual activity during the last 6 months, that is since [month of year]. In answering these questions, please

include all persons in the last 6 months with whom you had oral, anal, or vaginal sex. By oral sex, we mean stimulating the genitals with the mouth, that is licking or kissing your partner's genitals or when you partner does this to you. By anal sex we mean, when your penis is inside your partner's anus or rectum or your partner's penis is inside your anus or rectum. By vaginal sex we mean when a man's penis is inside a woman's vagina.

"Remember, everything you tell me is confidential. Think carefully over the last six months. Remember to include all partners, a spouse or regular partner as well as anyone you might just have had casual sex with, like a quick hook-up, or someone you shared with another partner, even if you don't know their name. This includes men, women or transgender people. Thinking back over the past 6 months, that is since MONTH, how many people, including men, women, and transgender women have you had sexual activity with, even if only one time?"

That total count of sexual partners was verified with respondents by the interviewer, and the five most recent sexual partners were enumerated in reverse chronology; once participants made their nominations, participants who indicated a current primary sexual partner were prompted with a follow-up question inquiring whether that partner had already been nominated; if the primary partner was not among the five sexual partners listed, that name was added as the sixth.

Variables Related to Network Structure

MSM Network Size

The size of the respondent's MSM network was defined by the respondent's estimated number of other men who have sex with men respondents (1) knew and (2) with whom they communicated on a regular basis. This measure included MSM with whom respondents may have been sexual and non-sexual network members as well as MSM who may or may not have been listed in their core discussion/confidant network or their sexual networks. An analysis of the frequency distribution revealed outliers in the estimates of the MSM Network size; the variable was truncated at 100 which connoted the highest reports of MSM network size.

BMSM Network Size

Respondents were prompted to estimate the number of BMSM between the ages of 16 and 29 whom they knew well on a first name basis, and with whom they were likely to have contact within the following two weeks. Similar to the MSM network size, the BMSM network size had outlier estimates. Thus, the variable was truncated at 50 BMSM based on an analysis of the distribution frequency.

Core Discussion/Confidant Network Size

The confidant network size was the total number of individuals the respondent identified as feels close to and whom the respondent discusses things of importance. Up to five individuals could be identified, and there was no other restriction on characteristics of potential network members (i.e., irrespective of gender identity, sexual orientation,

race/ethnicity, age, type of relational tie, etc.). Alters in this network were referred to as 'confidants.'

Core Discussion/Confidant Network Density

Confidant network density was the measure of the proportion of actual ties between confidants in the network among the total number of potential ties between confidants. Prompted by the instruction to indicate which alters rostered in the alter slots knew each other, respondents used a visual screen to report known alter-alter connections (Asked: "To your knowledge, does [alter 1] know [alter 2]?"). Network density ranges from 0 to 1, the number 1 reflecting a network in which all potential connections between confidants were actual connections.

Sexual Partnership Network Size

The size of the sexual partnership network was defined by the number of sexual partners in the previous six months, up to five sexual partners and included the main or primary sexual partner as the sixth if not listed among the five most recent. Sexual partners included women, men and transgender identified individuals with whom respondents had oral, anal, or vaginal sexual contact.

Iteration of Covariates for Study 2 & Study 3

A range of ego-level demographic and socio-structural factors were collapsed into binary variables. Covariates measured: age, relationship status (single vs partnered), income insufficiency in the last six months, homelessness in the last 12 months, education (college

degree vs high school or less), current student status, self-report HIV status, gender identity (transgender vs cisgender), participation in giving or receiving sex in exchange for money, drugs, shelter, or other goods, and having a main/primary sexual partner (i.e., "a person you have sex with and feel committed to above anyone else; this is a partner you call your boyfriend/girlfriend, significant other, spouse or life partner"); the latter two, main/primary sexual partner and participation in sex exchange, were only used in the sexual partnership network adjusted model in Study 2.

Measuring Closeness or Attachment to Collective Social Identity

The primary independent variable was "Closeness of Ties with Black & Gay Communities." Community closeness reflects cognitive and affective components of affiliation or group identity [9-10]. In a previous study by Williams, Spencer and Jackson [11] exploring race, the stress of discrimination and physical health outcomes they used the racial closeness item to assess the strength of racial group identity using at 4-point response scale ranged from very close to not close at all, with higher scores indicating a greater sense of closeness in community connectedness. Following Williams et al. [11], Frost and Meyer [10] used the single item to assess closeness in respondents' feelings to their racial group; their study added group-based identity associated with sexual orientation (i.e., "the gay community")

The items used in this study mirror the items used by Frost and Meyer [10] and Hotten et al. [9] in their study on community connectedness among sexual minorities:

1. How close do you feel to the gay community? Would you say…
2. How close do you feel to the Black community? Would you say…

Response options included “very close,” “somewhat close,” “not very close,” and “not close at all.” Response options were collapsed to create a binary response of close (inclusive of very close and somewhat close responses) vs not close (inclusive of not very close and not close at all responses). Additionally, to assess affiliations that were inclusive of black and gay communities together, the two single items were combined in the analysis to form the following pairings: feelings of closeness to both; closeness to Black, not gay; closeness to gay, not Black; closeness to neither.

Study 1: Statistical Analysis

Relationships between loneliness and all variables were first explored in chi-square analyses to identify differences between YBMSM reporting problematic loneliness and those reporting less than problematic loneliness. To further explore associations between predictor and outcome variables, we first fitted bivariate logistic regressions. Then a multivariate regression model was fitted with the outcome of loneliness, entering all candidate predictor variables that were independently significantly associated with loneliness (p-value <0.10). Some variables were also included in the final adjusted multivariate model based on theoretical relevance even if candidate variables did not reach p-value <0.10; they included age, sexual and gender identity, student status, and employment status. In the prior literature on loneliness, these variables have been indicated as associated with loneliness. Given that 32% of the sample were current students, the model was adjusted for student status as prior research indicates that college students have reported higher levels of loneliness [12]. Of note, 80% of YBMSM reports an income of

less than $20,000 a year, so we selected income insufficiency, a variable with greater variability, to enhance granularity as we examined economic stability. To account for dependent observations resulting from chain referral sampling, parameter estimates were obtained using the generalized estimating equation approach [13].

A few validation procedures were pursued to supplement the primary analysis. In addition to adjusting for respondents who reported transgender identity, the final multivariate model was analyzed excluding transgender respondents. All significant associations were retained in that analysis as the full model that included transgender respondents. Additionally, we considered that the relationship between the loneliness measure and the psychological distress score were potentially influenced by collinearity given the loneliness item was taken from the same scale. So, we performed an exploratory stratified analysis that compared YBMSM with low psychological distress scores (scores below the clinical cut-off)/high loneliness (problematic loneliness) versus high psychological distress scores (scores above the clinical cut-off)/high loneliness (problematic loneliness). Missing data represented less than 10% of the sample and were treated as missing at random [14]. For logistic regression analyses, cases with missing data were not included in the analysis.

Study 2: Statistical Analysis

First, descriptive analyses were conducted to describe characteristics of YBMSM in the sample and prevalence of loneliness in the sample. Frequency distributions of network size were visualized to identify influential points and outliers. Outliers were truncated for the MSM and BMSM networks. Scatterplots were used to visualize the relationship

between networks and loneliness. Visual inspection of plots prompted consideration of spline modeling to linearize the relationship of loneliness with MSM and BMSM networks. Based on statistical significance ($p < 0.05$) discovered during stepwise spline modeling, those variables were inserted into the final model for that network. Conversely, the BMSM network did not yield significant splines, and so it was concluded that the effect of BMSM network size was linear and did not require spline modeling.

Bivariate associations were first conducted before adjusting models with socio-structural and demographic covariates which were chosen based on their theoretical influence on network size and structure and their relationship to loneliness. Multivariate logistic regression analyses were then conducted to examine the relationship between loneliness and the structure of networks; first, the base model was applied to models with the network factor and loneliness. For the sexual partnership network, it was observed that when adjusting the model with a splined MSM network size, the size of the effect was no longer statistically significant in the model. To more fully understand the impact of MSM network size on sexual partnership and loneliness, a forward stepwise selection process was applied in which each covariate was added to the predictor and dependent variable. The Generalized Estimating Equation approach provided robust standard errors to account for correlated observations among respondents who were referred into the study by peers in their network [13]. Missing data accounted for less than 10% among all relevant variables and were treated as missing at random. All statistical analyses were conducted using Stata 15. A two-tailed p-value of less than 0.05 was considered statistically significant and p-values greater than 0.05 and less than 0.10 were considered marginally statistically

significant. Missing data represented less than 10% of the sample and were treated as missing at random [14]. For logistic regression analyses, cases with missing data were not included in the analysis.

Study 3: Statistical Analysis

Descriptive analyses were conducted. Predictors and covariates were identified and collapsed to be analyzed as dummy variables (as previously described in the Methods). Bivariate logistic regressions were conducted to determine statistically significant relationships with the dependent variable before adjusting in a multivariate logistic regression model. Additionally, analysis of potential interactions between variables was also explored. The Generalized Estimating Equation approach was used to provide robust standards of error to account for correlated observations among respondents who were referred into the study by peers in their network [13]. Missing data accounted for less than 10% among all relevant variables and were treated as missing at random [14]. A two-tailed p-value of less than 0.05 was considered statistically significant and p-values greater than 0.05 and less than 0.10 were considered marginally statistically significant.

All statistical analyses for Studies 1-3 were conducted using Stata 15 [15].

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CHAPTER THREE

Manuscript 1

Socio-structural Correlates of Loneliness Among an Urban Sample of Young Black MSM

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ABSTRACT

Background: Loneliness has been found to be a significant predictor of several adverse physical and mental health outcomes. The experience of loneliness—countering fundamental belongingness needs, shapes interactions that influence physiological processes related to health and provides a context for important health behaviors. Predominately explored among older adult populations, recent attention has brought into focus the surpassing prevalence of loneliness among young adults when compared to older adults. Loneliness as a health challenges has also sparked consideration of other marginalized populations such as young Black men who have sexual relationships with men (YBMSM) given the complex social arrangements YBMSM confront, socio-structural factors implicated in the experience of loneliness which have yet to be fully explored among this at-risk population. The resulting risk of fragmentation to the social well-being of YBMSM is of special concern given the HIV epidemic among BMSM; consequently, exploration of the social context influencing relationships and psychological well-being is critical for understanding the sexual health of Black MSM.

Objective: The objective of this study was to describe the prevalence of loneliness and examine hypothesized socio-structural "loneliness provoking factors" in an urban, population-based sample of YBMSM ages 16-29.

Methods: A total of 618 respondents with primary residence in the South Side of Chicago were recruited through respondent driven sampling. Baseline data were collected from a survey instrument that obtained sociodemographic, sexual health, and behavior data. Using a single-item measure of loneliness, respondents reported on a five-point Likert scale the degree to which feelings of loneliness had been distressing or bothersome over the past week. Problematic loneliness was assigned to responses of "quite a bit" and "extremely" vs less problematic loneliness assigned to responses "not at all," "a little," and "moderately." Chi-square tests were conducted to identify factors associated with problematic loneliness. Association between socio-structural factors and problematic loneliness was examined with bivariate and multivariate logistic regressions, including an exploratory logistic regression of problematic loneliness onto sociocultural factors stratified by YBMSM with problematic loneliness and low or high psychological distress as measured by the Brief Symptom Inventory (BSI-18) clinical cut-off score.

Results: Approximately 19% of the sample reported more distressing and bothersome loneliness, referred to as problematic loneliness. In the adjusted regression analysis, income insufficiency, college degree, unstable housing, non-partnered relationship status, criminal justice involvement, and self-reported HIV seropositivity were all independent predictors of problematic loneliness. Stratifying by mental health status (clinical cut off scores of the BSI-18 denoting more distressing psychological symptoms), associations of loneliness with socio-structural factors were not found for YBMSM experiencing clinically

significant psychological distress and problematic loneliness as associations were found for YBMSM with problematic loneliness and lower BSI-18 scores and the model including the full sample.

Conclusion: Findings suggest that loneliness among YBMSM was predicted by several socio-structural factors known to disrupt social stability. Results are discussed in the context of the possibility that loneliness is not simply due to low social competency, and that loneliness among YBMSM might be addressed by a focus on intervenable social determinants of health. Greater attention to social connections among YBMSM may be important to the development of targeted health interventions and the overall improvement of their social, mental and physical well-being. Improving the sexual health of YBMSM may necessitate strategies that protect pathways to the safe fulfillment of deeply rooted and consequential social needs of connection and belonging.

Loneliness and the feeling of being unwanted is the most terrible poverty.

-Mother Theresa

BACKGROUND

There is a large body of evidence that social relationships are critically important to mental and physical well-being [1]. Social relationships fundamentally integrate the individual into society and offer a sense of belonging and intimacy within those social contexts [2].

From the viewpoint of some scholars, the quantity and quality of social relationships are declining in industrialized societies (see [3-5] for further discussion). Given the risk of fragmentation to social relationships by contemporary social problems, increased attention to upstream and downstream determinants of health associated with the functioning of social relationships seems to warrant prioritization in public health. Emile Durkheim early on emphasized the relationship between society and health by noting how individual behavior arises out of the patterning of "social facts" [6] and more recently, Holt-Lunstad et al., backed by substantial research evidence [3, 6-8 for review], asserted that "social connection demonstrates a level of seriousness comparable to other leading health determinants and other social determinants of health [1, p.519]."

As individuals appraise their social relationships, deficits in social connectedness can be experienced as feelings of loneliness [9-11]. Loneliness, also called perceived social isolation, is experienced as the negative emotional state when a person perceives inadequacy in the fulfillment of their desired experience of intimacy for social relationship(s) [12-13]. It entails a subjective evaluation of the discrepancy between perceived and actual access to the individual's threshold quantity and quality of relational ties [12-13]. As an important distinction, 'aloneness', objective social isolation and solitude are conceptually different from loneliness [12, 14-16] as not all people with few social contacts experience loneliness [16].

Though everyone may experience some degree of loneliness at some point in their lives, it is estimated that loneliness is experienced more intensely by as many as 15-30% of the general population, but studies used to estimate loneliness prevalence are dated and may not reflect the current incidence of loneliness [17, 31]. Loneliness is not only the condition of the aged; higher levels of loneliness have been reported among young adults (15-30 years old) compared with older adults (60+ years) [18-19]. Yet, the literature reflects that loneliness is most often studied in older adult populations [20] with insufficient attention to loneliness among younger populations as well as other vulnerable communities such as racial/ethnic minorities, and sexual minorities [21].

Young Black men who have sexual relationships with men (YBMSM) is a population exposed to a complex set of circumstances which create a social context that places their health and social well-being at-risk [22]. While current estimates predict that 1 in 2 black MSM will be diagnosed with HIV in his lifetime, still as articulated by Matthews, Smith, Brown and Malebranche, the HIV epidemic is "but one star in a constellation of social inequalities that affect YBMSM" [23]; it stands to reason that multiple "social facts" experienced by YBMSM such as racism, stigma, poverty, gun violence, unjust policing practices, redlining of neighborhoods and other unfair housing practices, and inequitable access to quality education and healthcare—to name a few, threaten a stable sense of social connectedness. A fuller understanding of the patterning of "social facts" in the lives of YBMSM and the ways it undermines social integration could provide deeper insight as to

the context of the pressing health challenges they face, and inform the development of more effective public health responses.

As social relationships play fundamental roles in human life and health processes, then, loneliness is likely an important psychosocial factor, though loneliness research framed beyond sexual risk behavior among MSM is sparse [24-26]; studies examining its association with sexual risk behavior suggest loneliness and social disconnection may be relevant to HIV transmission risk among YBMSM [24-26]. Associations between HIV transmission risks for Black MSM and social stability have been established in multiple studies; yet underexplored is the relevance of those social stability factors to deficits in social connection experienced as loneliness, and the implications thereof.

Loneliness and Health

Loneliness has been found to be a significant predictor of several adverse health outcomes independent of other risk factors [27-29] including depression [30-31]. Several emotional and cognitive health outcomes have also been identified as susceptible to the impact of loneliness on emotional well-being [31] such as suicidal behaviors [32-33] increased depressive symptoms [30, 34] and a poorer prognosis [35-36), poorer health behaviors [17, 37-39], reduced physical activity [40], obesity and alcohol abuse [38, 41]. Taken together, the evidence suggests that social connectedness broadly shapes interpersonal and

intrapersonal dynamics which alter physiological processes that influence health and other important health behaviors [42-43].

Loneliness-Provoking Factors

Loneliness theorists de Jong Gierveld, van Tilburg and Dystra [12] note that the problem of loneliness cannot be exclusively reduced to failures of individual social competency. Loneliness is thought to be influenced by relevant characteristics of one's social context including sociodemographic factors de Jong Gierveld et al. [12], have referred to as "loneliness-provoking factors." Building on that notion, in this paper we sought to characterize loneliness among YBMSM by examining a cascade of social contextual factors related to social stability that also have been previously identified as predictors of loneliness [see 44-46].

Social stability is a construct depicting the interrelatedness and synergistic action of factors of social disadvantage representing several domains and how an interplay of social circumstances among those domains can generate instability [47]. A synthesis of the literature on social stability by German [48] revealed core factors of social stability from several domains are associated with health issues including the prevention of infectious diseases, medication adherence, and substance use [47-48].

Present Study

The goal of the present study was to examine factors associated with loneliness in an urban, population-based sample of YBMSM ages 16-29. We selected factors likely to be in the pathway of health and well-being for YBMSM. We examined the association of loneliness with the following hypothesized "loneliness-provoking factors": age, sexual and gender identity, educational attainment, and psychological and HIV health status along with other factors related to social stability including relationship status, income sufficiency, residential stability, and involvement with the U.S. system of corrections, given the disproportionate impact of mass incarceration upon the psychosocial and material well-being of Black males.

While the loneliness literature is primarily representative of studies involving non-sexual minority, older adults, those results may not be generalizable to urban, young Black MSM. Thus, the study affords an opportunity to characterize loneliness among this socially at-risk population. Through an appraisal of social relations, this study seeks to better understand the intersection of social needs and social context, and how that nexus can be a threat or facilitator to thriving amidst the complex social disadvantages that YBMSM face.

METHODS

Setting

The data used in this study were collected from June 2013 to July 2014 as part of the baseline wave of the uConnect study, a longitudinal study conducted over 18 months.

Baseline measurements for the study included data from a total of 618 YBMSM from the South Side of Chicago which is known as the largest contiguous Black urban community in the United States[49] with an age-adjusted mortality rate that is 35% higher than other areas of Chicago and 25% higher than the nation's mortality rate [50].

A diverse group of about twenty organizations that interface with YBMSM was invited to a meeting to discuss the objectives and importance of the study. Each attendee was then asked to nominate three YBMSM who were *socially active* in the community and likely to bring others like themselves into the study, which resulted in a diverse group of 62 seeds recruited from twenty community partners from: the House/Ball community, online communities, community organizers, youth dance groups, Black fraternities, college campuses, gay families, those involved in sex work industry, gym-based settings, church, clinics, and support groups. The study protocol was approved by the Institutional Review Board of NORC at the University of Chicago.

Eligibility

Using Respondent Driven Sampling (RDS), each seed and subsequent recruits were given six coupons each printed with a unique ID number and invited to recruit other YBMSM into the study. Respondents were recruited between June 2013 and July 2014. Eligibility criteria included 1) self-identified as African American or Black, 2) assigned male gender at birth, 3) between the ages of 16 and 29, 4) reported having had oral or anal

sex with a male within the past 24 months, and 5) were willing and able to provide informed consent at the time of the study visit. Each respondent was offered $60 for participation in the interview and was informed that for each additional recruit who participated they would receive an additional $20. Of the 62 seeds recruited, 37 successfully recruited at least one additional person; referral chains had a maximum length of 13 and a median of 3.

Survey Development

The survey design and instrument were developed over a year by a multi-disciplinary team of public health and social science researchers. The survey instrument obtained sociodemographic, sexual health, and behavior data through the following measures:

Loneliness

Loneliness was measured using a single-item from the Brief Symptom Inventory 18 (BSI-18) [51] which is an 18-item shortened version of the 53-item Brief Symptom Inventory. It was developed as a screen for psychological symptoms for individuals in medical and community settings to identify individuals with high-risk for clinical mental health diagnoses.

Loneliness measure:

The BSI Instructions Read: "Below is a list of problems people sometimes have. Read each one carefully and mark the choice that best describes **how much that problem has distressed or bothered you during the past 7 days, including today."**

For the item “Feeling lonely,” responses on a five-point Likert scale include “not at all”; “a little bit”, “moderately”, “quite a bit”, and “extremely”. The analytical cut point used to define the variable was determined based on the review of previous studies use of the single item measure and the frequency distribution of responses to the item in this sample. Previous studies have used cutoffs that include responses from moderate to the most extreme to define the loneliness variable. To increase specificity, moderate responses were excluded from the loneliness group; those reporting feelings of loneliness that were extremely or quite a bit distressing or bothersome were referred to as the ‘problematic loneliness’ group.

Sexual & Gender Identity

Respondents were given several options from which to choose in response to the following questions: *Gender identity*: (1) Do you consider yourself to be transgender? Responses were coded as yes or no. *Sexual Identity*: (2) Do you consider yourself to be gay, straight, bisexual, or something else?

Relationship Status

To assess relationship status, respondents were asked: “What is your current relationship status? Are you in a relationship with a man? In a relationship with a woman? In a relationship with a transgender woman? Not in a relationship? Other? The variable was

collapsed into a binary variable which described those who responded "yes" to any of the options of 'in a relationship' vs not in a relationship.

Income Insufficiency

Respondents were asked, "In the last 6 months, how often was there not enough money in the household for rent, food, or utilities (for example gas, electric, phone)?" Responses included: never, once in a while, and very often (fairly often and very often were collapsed into one category response).

Employment Status

Respondents were asked: "Are you currently working full time, part time, or not employed?" Options for response included: full-time employment at 30 hours or more/wk, part-time employment at less than 30 hours/wk, and not employed. The item was collapsed into a binary of employed or not employed.

Residential Stability

Respondents indicated how many places they had lived in the past 12 months. The variable was transformed into a binary variable which included the responses: have only lived one place vs. 2 or more in the past 12 months.

Student Status & Educational Attainment

Respondents were asked about their student status (full time, part time, not a student) and they were also asked about the highest level of school or highest degree, certificate or license attained. The variable was transformed to a categorical variable which included: (1) high school degree/GED or less; (2) some college (no degree) and (3) Associates degree, technical/vocational license, bachelor's degree or higher.

Mental Health

The BSI-18 was used to assess mental health status. The sum score reflects a 'Global Severity Index' for which higher numbers reflect greater psychological distress [51-52]. Participants were presented with a "list of problems people sometimes have" and were instructed to mark the choice that best describes how much that problem has distressed or bothered them during the past 7 days. Scores were summed and converted to T-scores; T-scores greater than or equal to 63 were used as the clinical cut-off score to indicate significant distress per the scale's scoring guidance [51-52].

Self-reported HIV Status

Respondents' self-reported HIV status was elicited with the item- Have you ever been diagnosed with HIV? The variable response was coded as "yes" or "no."

Criminal Justice Involvement (CJI)

Respondents were asked if they had ever been detained, arrested, or spent time in jail or prison. Variable response was coded as "yes" or "no."

Statistical Analysis

Relationships between loneliness and all variables were first explored in chi-square analyses to identify differences between YBMSM reporting problematic loneliness and those reporting less than problematic loneliness. To further explore associations between predictor and outcome variables, we first fitted bivariate logistic regressions. Then a multivariate regression model was fitted with the outcome of loneliness, entering all candidate predictor variables that were independently significantly associated with loneliness (p-value <0.10). Some variables were also included in the final adjusted multivariate model based on theoretical relevance even if candidate variables did not reach *p-value* <0.10; they included age, sexual and gender identity, student status, and employment status. In the prior literature on loneliness, these variables have been indicated as associated with loneliness. Given that 32% of the sample were current students, the model was adjusted for student status as prior research indicates that college students have reported higher levels of loneliness [53]. Of note, 80% of YBMSM reports an income of less than $20,000 a year, so we selected income insufficiency, a variable with greater variability, to enhance granularity as we examined economic stability. To account for dependent observations resulting from chain referral sampling, parameter estimates were obtained using the generalized estimating equation approach.

A few validation procedures were pursued to supplement the primary analysis. In addition to adjusting for respondents who reported transgender identity, the multivariate model was analyzed excluding transgender respondents. All significant associations were retained in that analysis as the full model which included transgender respondents. Additionally, we considered that the relationship between the loneliness measure and the psychological distress score were potentially influenced by collinearity given the loneliness item was taken from the same scale. So, we performed an exploratory stratified analysis that compared YBMSM with low psychological distress scores (scores below the clinical cut-off)/high loneliness (problematic loneliness) versus high psychological distress scores (scores above the clinical cut-off)/high loneliness (problematic loneliness). Missing data represented less than 10% of the sample and were treated as missing at random. For logistic regression analyses, cases with missing data were not included in the analysis.

RESULTS

Characteristics of the Sample

Sociodemographic and social factors of the sample are presented in Table 3-1. There were 618 respondents. The mean age was 22.8 years. The majority of YBMSM identified as gay (66.3%), and 48 (7.8%) respondents reported transgender identity. Almost two-thirds of YBMSM in the sample reported their relationship status as single. While roughly 39% of YBMSM in the sample had a high school diploma or less, almost 61% had

some post-secondary education; approximately one-third of the sample self-reported as current students. Most (82%) of the sample reported a yearly income of less than $20,000.

In total, 609 participants responded to the loneliness item. Forty-nine percent (49%) reported that loneliness had "not at all" been distressing or bothersome in the past week and approximately 21% percent responded, "a little bit." More distressing experiences with loneliness were reported by approximately 30% of YBMSM who experienced "moderately" "quite a bit" or "extremely" distressing or bothersome loneliness. For the purposes of this analysis, the loneliness single-item indicator was transformed into a binary variable: problematic loneliness ("quite a bit" and "extremely") vs less problematic ("not at all," "a little bit" and "moderately") which resulted in 19% of the sample reporting problematic loneliness.

No differences in loneliness were found by sexual or gender identity. There was a relatively small difference in age between the loneliness groups though not statistically significant; problematic loneliness was highest for those between the ages of 25-29. Over 43% of YBMSM experienced income inadequacy over the previous 6 months and were more likely to report problematic loneliness (X^2 =14.59, p=0.001). Unemployment was relatively high among YBMSM in the sample at 31%, and a higher proportion of unemployed YBMSM experienced problematic loneliness compared with those who were employed though significance was marginal (X^2 =3.63, p=0.057). Nearly 46% of YBMSM were unstably

housed with a greater proportion having reported problematic loneliness (X^2 =7.78, p=0.005). With respect to criminal justice involvement, 46% of YBMSM had ever been detained, arrested or spent time in jail or prison and more likely to report problematic loneliness (X^2 =13.58, p=0.001.)

The mental health status of YBMSM was assessed using the BSI's global severity index; the composite score reflects the extent of psychological distress. There was adequate internal consistency of the BSI scale (Cronbach's alpha=.93). Ten percent of the sample had clinically relevant cut-off scores of psychological distress (>63); results showed a significant relationship with problematic loneliness by mental health status (X^2 =147.30, p=.001). Within the sample, 24% of YBMSM self-reported as HIV positive and seropositivity was also associated with problematic loneliness (X^2 =11.26, p=0.001)

Bivariate & Multivariate Analyses of Socio-structural Factors and Loneliness

Unadjusted bivariate analysis (Table 3-2) showed no relationship between loneliness and age, sexual identity, educational attainment, or current student status. Reporting transgender identity, unemployment, residential instability over the past year and income insufficiency within the last six months were all positively associated with problematic loneliness. We found greater income insufficiency was associated with increased odds of problematic loneliness. As anticipated, being partnered in a relationship reduced odds of problematic loneliness. Problematic loneliness was positively associated with criminal

justice involvement (CJI) over the lifetime. Lastly, problematic loneliness was associated with both self-reported HIV status and clinically relevant scores for global psychological distress.

When adjusting for socio-structural factors in the multivariate regression analysis, a significant association between education and loneliness emerged in an unexpected direction. YBMSM with a college degree compared to those with high school diploma or less education had more than twice the odds of problematic loneliness. Though no relationship between problematic loneliness and unemployment was found, problematic loneliness was positively associated with financial and residential instability after controlling for other social stability factors. The following social factors: partnered relationship status, CJI, and self-reported HIV seropositivity were attenuated in the adjusted analysis.

Exploratory Analysis: Loneliness Among High Psychological Distress Vs. Low Psychological Distress

The bivariate analysis indicated that clinically relevant mental health distress was highly associated with problematic loneliness (OR=23.85, CI: 16.09, 35.33). To further explore this association, we conducted a stratified analysis by level of psychological distress. Table 3-3 shows the results of those regression models. The problematic loneliness and low psychological distress group retained associations identified in the full sample adjusted

model including relationship status, education, income insufficiency, residential instability, and CJI, but not HIV status. However, for YBMSM experiencing problematic loneliness and high psychological distress, only income insufficiency was associated with loneliness.

DISCUSSION

Loneliness among young Black MSM has not been adequately characterized in the literature. As such, this study examined the relationship between social connection and oft-studied social determinants of health affecting the health of young Black MSM. The proportion of YBMSM reporting problematic loneliness, 19%, is within the prevalence range of studies which have estimated 15-30% in the general population [17, 54-55]. More studies with this population using agreed upon measures of loneliness would contribute to more reliable estimates of loneliness prevalence among YBMSM and allow for comparisons across populations. There was no effect of age on problematic loneliness within this age cohort of YBMSM; nonetheless, evidence in the literature maintains that loneliness is not just the vulnerability of the aged, and that loneliness among younger populations warrants future studies [18].

Informed as to how social determinants may be contextualized by social marginalization and stigma among non-heteronormative gender and sexual identities [56], the analysis examined the effect of sexual and gender identity and found no statistically significant relationship with loneliness. Additionally, an exploratory analysis that excluded

transgender respondents revealed a similar pattern of associations was observed in the model inclusive of the full sample. Furthermore, retaining gender and sexual identity in the multivariate model to account for the influence of those experiences suggests that associations are likely attributed to more than holding marginalized identities. Results of a stratified analysis examining mental health and loneliness suggest that associations among socio-structural factors in this sample are likely not exclusively attributed to poor mental health.

Financial Insecurity

Poverty was high in this sample. While yearly income and unemployment have been associated with loneliness [57-58], this study did not find those associations directly but did so with income insufficiency. Inadequate incomes are thought to restrict an individual's involvement in social activities which may limit opportunities for YBMSM to build and maintain social ties that achieve the desired experience of social bonding [18, 59]. While poverty does not necessarily forebode the absence of meaningful interactions [60], income inadequacy may specifically affect socialization expectations and in turn diminish social engagement for YBMSM, an important path to social network expansion during young adulthood.

Education

We unexpectedly found 2.4 times greater odds of problematic loneliness among YBMSM who earned a college degree compared to those with a high school or less education and those with some exposure to post-secondary education. Studies have generally reported lower levels of education associated with higher levels of loneliness and poor health [61-62]. Considered a proxy for social integration [63-64], educational attainment is thought to make economic and social mobility more accessible. Yet, Assari [65] found that educational attainment for Black males does not necessarily confer the same advantage of protection against poor mental well-being as it does for Whites and Black women with similar education; disadvantage is attributed to increased interpersonal and labor market discrimination experienced by more educated Blacks [65].

There is a social cost to high educational attainment, and upward mobility which can result in feeling alienated from previously established ties or limited opportunities to develop and maintain new ones—sacrificed in pursuit of educational attainment and upward mobility. In one qualitative study, highly educated individuals described the difficulty of finding suitable romantic partners, highlighting constraints on their time for socializing and a general lack of awareness and access to social spaces due to educational pursuits; subsequently, when there is less access to those relationships, it can reinforce low self-efficacy in social competency [66].

Residential Instability

YBMSM who were unstably housed had 1.7 times greater likelihood of problematic loneliness, adjusting for financial instability. Transient housing and the stress of moving multiple times may make it more challenging to cultivate meaningful relationships, disrupt social networks, and reduce a sense of connection to the larger community [67]. Housing has been studied as a critical contributor to health disparities in the U.S. [68-69], and stable housing is thought to protect health [70-72]. Housing insecurity via high transience/moving has been deemed an intergenerational obstacle to social connectedness, worthy of strong safety net policies that secure social inclusion for the unstably housed [73]. With less housing stability, people lose significant social connections and place a strain on supportive social relationships long before becoming homeless [74]; once homeless they can experience further difficulty securing new ties that adequately meet social and belongingness needs [75]. Supportive and stable housing, on the other hand, has been found to build residents' confidence, broaden capacity for constructing meaning in life, and invites opportunities to restore relationships with family, friends, and the community [76]. As public health strategies give attention to improved housing stability for populations with chronic health challenges such as HIV [77], approaches might consider maintaining the prioritization of social integration and social connectedness in assessment and intervention subsumed within housing services.

Relationship Status

The absence of partnered relationships during the young adulthood of YBMSM may, in fact, be penalizing to the social well-being and health of YBMSM. Being partnered was protective for YBMSM linking reduced odds of problematic loneliness by over 50% whereas discrepant findings from previous studies conducted with young adults have reported no relationship with loneliness [78-80]. Marriage and non-marital, high quality romantic partnerships have been associated with reduced loneliness because they are said to provide enhanced access to social supports in a partner [81]; additionally, partnered relationships have been found to play a key role in identity, self-concept and psychological well-being [82]. Alternatively, it may be that lonely YBMSM with social skills deficits are less likely to have romantic partners.

Helping YBMSM to cultivate, grow and maintain high quality romantic partner relationships—not just enjoy safer sex—is a potential pathway to greater psychological well-being. In service to capitalizing intervention efforts, health promotion strategies should maintain an emphasis on the inclusion of roles for partners as there is evidence that embeddedness of quality relationships promotes social well-being among YBMSM.

Sexual Health Status

YBMSM who self-reported HIV-positive status had twice the odds of problematic loneliness. While few studies have examined loneliness in People Living with HIV (PLWH) compared with HIV negative adults, the available evidence confirms that people

living with HIV have high levels of loneliness [83-84] possibly attributed to internalized HIV-stigma [85]. Studies suggest that internalized HIV stigma, compounded by other social inequalities, creates difficulty accessing supportive social relationships. This may be due partly because of the anticipation of social rejection and feeling devalued [86-89]. Stress resulting from a marginalized, minoritized status, and stress from internalized HIV stigma, have been directly associated with social isolation, decreased social supports and loneliness [90-92]. This finding suggests the value of encouraging HIV/AIDS service organizations to explicitly incorporate opportunities to cultivate desired levels of relationship and social support for YBMSM living with HIV.

Loneliness among people living with HIV also carries health implications such as sexual risk behavior [93] and increased risk for major depressive symptoms found among older adults [94]. Because studies have linked loneliness with immunoregulation and inflammation, the consequences of more distressing loneliness on the immune systems of HIV positive YBMSM warrants attention as it could negatively impact HIV disease progression [17, 84, 95].

Criminal Justice Involvement (CJI)

Over 45% of YBMSM in this sample reported involvement with the criminal justice system over their relatively short lifetime and reported nearly twice the odds of problematic loneliness compared to those without CJI. The disproportionate incarceration of Black

men ages 18-19 and 20-24 who have incarceration rates that are 10.5 and 6.6 times the rate of white men, respectively is one of several structural risk factors uniquely impacting BMSM compared with other MSM [96-97]. In addition to contending with increased exposure to deleterious socioeconomic factors and concomitant increased levels of stress [98], CJI YBMSM may feel the added burden of social isolation which is particularly concerning as it could thwart efforts to reduce recidivism and enhance social integration upon community reentry. Evidence suggests that loneliness, in addition to social and structural vulnerabilities, may trigger engagement of formerly incarcerated men in health risk behaviors as a means of coping with the unaddressed pain of social isolation [99].

Limitations

This study has limitations. Measures were based on self-reported information which may be influenced by social desirability, particularly with the measure of loneliness as the use of the word "lonely" can be stigmatizing. The single-item measure of loneliness used in the study was extracted from the self-report depression subscale of the BSI-18 and therefore cannot be validated or assessed for reliability. However, Childs and Lawton suggest that single measures of loneliness that are used to estimate the prevalence of loneliness within a given population are reliable in addition to its compatibility for higher quality data when reducing survey burden with shorter surveys [80]. Another strength of the single-item indicator used in this study is its descriptive value beyond assessing the presence or absence of loneliness.

Another limitation of the item is that it captures the respondent's experience of loneliness over the past seven days; thus, it is not known whether the measure is assessing a more situational or state-based experience of loneliness compared to a more pervasive and trait-based expression of loneliness. There is evidence, however, that state and trait levels of loneliness are highly correlated with validated loneliness scales (Eeske van Roekel, Verhagen, Engels, Scholte, Cacioppo and Cacioppo, 2018).

CONCLUSION

Our findings add support to the contention that the social pain of loneliness is not entirely a deficit arising from the personal attributes of the lonely, but loneliness may also interact with socio-structural factors of social disadvantage such as those that YBMSM encounter. Supported through the social stability framework, we found multiple social stability domains associated with problematic loneliness among YBMSM. As attention to the impact of social determinants of health continues to grow and within efforts that seek to improve social stability, it may be worth integrating strategies that also enhance social connectedness and relieve the distress of loneliness. The results suggest that we cannot ignore the intersection between social determinants and social connection if we are to impactfully reduce loneliness and improve the well-being of YBMSM.

Future public health studies should consider giving greater attention to measuring the quality of social connections as meaningful indicators of well-being among YBMSM particularly in addressing one of the major health challenges facing YBMSM—vulnerability to HIV transmission—through emergent, enhanced HIV prevention and care innovations. As interventions are developed to impact social stability factors and improve social connectedness, research will be needed to assess whether improvements to socio-structural factors (i.e., greater financial stability, housing support programs, programs that enhance the social integration of post-CJI YBMSM) also result in concomitant reductions to loneliness and poor health; those studies would be helpful to determine the dosage of structural interventions that might be required to impact the health and social well-being of YBMSM.

TABLES AND FIGURES

Table 3-1. Characteristics of the sample of YBMSM ages 16-29 by the degree of loneliness distress.

		Total	Less Problematic Loneliness	Problematic Loneliness		
	N	n (%)/ mean (SD)	n (%)	n (%)	χ^2 test statistic	*p*-value
Age	609	22.8 (3.1)	22.7 (3.1)	23.1 (3.2)	(CI=22.5, 23.0)	0.251
16-18		50 (8.2)	41 (82.0)	9 (18.0)		
19-24		388 (63.7)	321 (82.7)	67 (17.3)		
25-29		171 (28.1)	95 (77.2)	31 (22.8)		
					2.41	0.300
Sexual Identity	609					
Gay		402 (66.0)	328 (81.6)	74 (18.4)		
Bisexual		166 (27.3)	131 (78.9)	35 (21.1)		
Something else		41 (6.7)	35 (85.4)	6 (14.6)		
					1.07	0.586
Transgender	607	48 (7.9)	35 (72.9)	13 (27.1)	2.36	0.125
Relationship Status-Single	608	369 (60.7)	285 (77.2)	84 (22.8)	9.07	**0.003**
Low Income (<$20, 000/yr)	592	484 (81.8)	396 (81.8)	88 (18.2)	1.97	0.160
Income Insufficiency (Last 6 months)	601					
Often		81 (13.5)	58 (71.6)	23 (28.4)		
Once in a while		178 (29.6)	134 (75.3)	44 (24.7)		
Never		342 (56.9)	295 (86.3)	47 (13.7)		
					14.59	**0.001**
Unemployed	609	194 (30.9)	144 (76.6)	44 (23.4)	3.63	**0.057**
Education	608					
H.S. Diploma or less		236 (38.8)	196 (83.1)	40 (16.9)		
Post-secondary w/o degree		276 (45.4)	224 (81.2)	52 (18.8)		
Associates Degree or higher		96 (15.8)	73 (76.0)	23 (24.0)		
					2.19	0.335
Student Status	609					
Not Student		413 (67.8)	331 (80.1)	82 (19.9)		
Full-time		132 (21.7)	103 (78.0)	29 (22.0)		
Part-time		64 (10.5)	60 (93.8)	4 (6.2)		
					7.74	**0.021**
>1 Residence (Last 12 months)	608	278 (45.7)	212 (76.3)	66 (23.7)	7.78	**0.005**
Clinical Psychological Distress	590	59 (10.0)	12 (21.1)	45 (78.9)	155.16	**0.000**
Self-report HIV+	606	148 (24.4)	106 (71.6)	42 (28.4)	11.26	**0.001**
Criminal Justice Involved (lifetime)	609	282 (46.3)	211 (74.82)	71 (25.3)	13.58	**0.000**

Table 3-2. Bivariate and multivariate associations between loneliness and socio-structural factors among YBMSM ages 16-29.

	Problematic Loneliness: Bivariate models	Problematic Loneliness: Full Model
	Crude odds ratio (95% C.I.)	Adjusted odds ratio (95% C.I.)
Age	1.04 (0.97, 1.12)	0.97 (0.90, 1.05)
Sexual Identity		
Gay	Reference	Reference
Bisexual	1.19 (0.80, 1.76)	1.12 (0.69, 1.84)
Something else	0.75 (0.41, 1.36)	0.55 (0.21, 1.44)
Transgender Identity	**1.69 (1.00, 2.83)**	1.49 (0.69, 3.23)
Partnered Relationship Status	**0.50 (0.34, 0.74)**	**0.44 (0.28, 0.71)**
Income Insufficiency (Last 6 months)		
Never	Reference	Reference
Once in a while	**2.06 (1.39, 3.04)**	**1.92 (1.24, 3.0)**
Often	**2.48 (1.58, 3.89)**	**2.34 (1.41, 3.91)**
Unemployed	**1.51 (1.06, 2.15)**	1.28 (0.83, 1.97)
Education		
H.S. Diploma or less	Reference	Reference
Post-secondary w/o degree	1.15 (0.69, 1.91)	1.31 (0.82, 2.10)
Associates Degree or higher	1.57 (0.88, 2.81)	**2.35 (1.23, 4.49)**
Student Status	0.82 (0.54, 1.23)	1.28 (0.85, 1.91)
>1 Residence (Last 12 months)	**1.79 (1.27, 2.52)**	**1.71 (1.15, 2.53)**
Psychological Distress (T-Score ≥63)	**23.85 (16.09, 35.33)**	-
Self-report HIV+	**2.15 (1.38, 3.35)**	**2.11 (1.30, 3.44)**
Criminal Justice Involvement (Lifetime)	**2.17 (1.49, 3.16)**	**1.97 (1.33, 2.93)**

Table 3-3. Associations among socio-structural factors stratified by psychological distress and problematic loneliness for YBMSM ages 16-29.

	Full Model	Problematic Loneliness/ Low Psychological Distress n=63	Problematic Loneliness/ High Psychological Distress n=45
	Adjusted odds ratio (95% C.I.)	Adjusted odds ratio (95% C.I.)	Adjusted odds ratio (95% C.I.)
Age	0.97 (0.90, 1.05)	0.91(0.81, 1.02)	1.06 (0.94, 1.18)
Sexual Identity			
Gay	Reference	Reference	Reference
Bisexual	1.12 (0.69, 1.84)	1.41 (0.81, 2.46)	0.74 (0.30, 1.83)
Something else	0.55 (0.21, 1.44)	0.22 (0.06, 0.79)*	1.95 (0.77, 4.90)
Transgender Identity	1.49 (0.69, 3.23)	1.08 (0.40, 2.87)	1.19 (0.46, 3.06)
Partnered Relationship Status	**0.44 (0.28, 0.71)**	**0.43 (0.26, 0.72)**	0.57 (0.25, 1.33)
Income Insufficiency (Last 6 months)			
Never	Reference	Reference	Reference
Once in a while	**1.92 (1.24, 3.0)**	**1.89 (1.14, 3.13)**	**2.76 (1.40, 5.41)**
Often	**2.34 (1.41, 3.91)**	1.36 (0.64, 2.86)	**4.99 (2.38, 10.46)**
Unemployed	1.28 (0.83, 1.97)	0.97 (0.62, 1.54)	1.52 (0.90, 2.60)
Educational Achievement			
H.S. Diploma or less	Reference	Reference	Reference
Post-secondary w/o degree	1.31 (0.82, 2.10)	1.69 (0.81, 3.53)	1.20 (0.69, 2.10)
Associates Degree or higher	**2.35 (1.23, 4.49)**	**4.47 (1.91, 10.48)**	0.88 (0.36, 2.13)
Student Status	1.28 (0.85, 1.91)	1.39 (0.74, 2.61)	0.81 (0.40, 2.13)
>1 Residence (Last 12 months)	**1.71 (1.15, 2.53)**	**1.59 (1.01, 2.52)**	1.68 (0.90, 3.13)
Self-report HIV+	**2.11 (1.30, 3.44)**	1.61 (0.89, 2.90)	1.94 (0.81, 4.67)
Criminal Justice Involvement (Lifetime)	**1.97 (1.33, 2.93)**	**2.88 (1.72, 4.79)**	1.08 (0.52, 2.27)

*Cell value <5

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CHAPTER FOUR

Manuscript 2

Structural Network Factors as Correlates of Loneliness among YBMSM:

Bigger is not Necessarily Better

Bradley, C.

ABSTRACT

Background: Loneliness, a form of perceived social isolation, involves the subjective evaluation of one's social support network and is experienced as an aversive emotional state resulting from a perceived deficit of sufficient social and emotional connections in their social networks. Young Black men who have sexual relationships with men (YBMSM) are a population vulnerable to loneliness due to a myriad social problems that potentially threaten their networks' capacity to adequately meet desired levels of social connection. Evidence has shown that individual-level sexual risk behaviors are insufficient to explain HIV disparities among YBMSM; consequently, research on the transmission of sexually transmitted infections such as HIV within sexual social networks of YBMSM has been pursued. As loneliness has been studied as a risk factor of HIV sexual risk behavior, little to no research has examined its relationship with the structural and functional aspects of the social networks that may lead to feelings of loneliness. Social network size has been studied as a key structural determinant of social isolation; however, there are mixed findings on the relationship between loneliness and network size and density among young adults, and none have assessed the relationship of loneliness and structural factors in the sexual and nonsexual social networks of YBMSM.

Objective: In this study, the relationship between loneliness and structural network factors, specifically size, density and type of YBMSM network was explored. We examined

loneliness as predicted by the size and density of their MSM and BMSM networks, their emotional support network, and their sexual partnership network.

Methods: Data in the study were collected as baseline measurements of the sexual and nonsexual social networks of YBMSM using network name generators and estimates of MSM network size provided by respondents recruited by their peers through a respondent driven sampling approach. Data from 618 YBMSM from the South Side of Chicago were collected as part of the uConnect study's 18-month, longitudinal population-based study of YBMSM. The size of MSM, BMSM, and sexual partnership networks, as well as the size and density of their core discussion network, were analyzed using logistic multivariate regression models adjusted for individual and sociocultural factors.

Results: Problematic loneliness (feelings of loneliness that were quite a bit too extremely distressing and bothersome) was reported by approximately 19% of YBMSM in the sample. Adjusted for financial and residential instability, HIV status, education, partner status, and the number of MSM known among other covariates, every additional member of YBMSM's network was associated with problematic loneliness. Greater density of the emotional support network was marginally associated with reduced loneliness. In the sexual partnership network, per additional sex partner, odds of loneliness increased by 15% until more than 10 MSM reported in the MSM network; beyond 10 MSM, the relationship between sexual partners and problematic loneliness was suppressed.

Conclusion: Having a greater number of network members does not necessarily mean that YBMSM will be less lonely; however, networks in which social support network members know each other embeds YBMSM in a network that potentially protects against loneliness. The findings suggest that the problem of the lonely is not so easily adjudicated by inducing contacts into the network or increasing socializing experiences. Results potentially draw attention to an emphasis on quality of interaction over the quantity of contacts. There is also evidence that increased numbers of sexual partners over six months is associated with problematic loneliness for YBMSM who reported knowing fewer than 10 MSM which may have implications for strategies to reduce multiple sexual partnerships among YBMSM who are more objectively socially isolated. As the emergent adulthood stage is characterized by growing networks and this study shows per additional person in the social network of YBMSM is associated with loneliness, there is a need to better understand the socialization patterns associated with enhanced social connectedness that may lead to better psychological and sexual health among YBMSM.

BACKGROUND

Social connections are critical to positive mental and physical health [1]. A key characteristic of those social connections is the extent to which individuals feel socially integrated or isolated [2]. Perceived social isolation, often called loneliness, is experienced as an aversive emotional state resulting from a perceived deficit of sufficient social and

emotional connections with others [3-4] through a subjective evaluation of their network [5].

There are populations that are particularly vulnerable to experiencing loneliness [6]. Young Black men who have sexual relationships with men (YBMSM), for example, encounter a complex set of social circumstances such as homophobia, racism, and poverty that place their health and social well-being at-risk [7]. Of the more pressing health challenges affecting YBMSM are high rates of HIV infection in the United States. The CDC estimated of all HIV diagnoses in 2016 that the rate of HIV diagnoses for Black men was nearly eight times as high as the rate among White men, with most new diagnoses among gay and bisexual men. YBMSM are among the most severely affected accounting for more infections than any other MSM subgroup [8]. The transmission risk of sexually transmitted infections such as HIV within the social networks of YBMSM has gained greater attention as a factor beyond the individual level to help explain disparities in HIV in response to findings that individual sexual risk behaviors of BMSM are an insufficient explanation for HIV disparity among MSM [9-11]. Given studies suggest loneliness could be relevant to HIV transmission risk among MSM [12-16], there is little to no research exploring the relationship between loneliness and the structural and functional aspects of the networks of YBMSM.

Loneliness & Health

Studies of predominately with older adults have shown that perceived and objective social isolation predict physical and mental health outcomes [17-18]. Specifically, loneliness has been identified as a significant predictor of several adverse health outcomes [19-21] even after statistically controlling for social support[22-23], depressive symptomology [22, 24], impaired regulation of immunity with smaller network size among the lonely [25], and dysregulated physiological stress responses [26], poor cardiovascular health [27-28] and other behaviors leading to poor health outcomes [27, 29-32].

Social Network Structure & Loneliness

Social network size—often viewed as a key structural determinant of loneliness [33], is a basic characteristic of any social network that provides access to social resources such as social support to impact health and well-being [34-35]. Among children and young adults especially, social networks function as a source for acquiring information about new opportunities and the development of one's sense of self, and the size of their networks is a predictor of loneliness for younger adults [36]. However, discrepant findings suggest that network size may not always be associated with loneliness [5] as the experience of being alone or having fewer social contacts does not necessarily guarantee the individual feels lonely [37]. In fact, individuals experiencing loneliness without objective social isolation may be less apparent to others [38]. Increased network density also has been associated with less loneliness among older adults [39]; however, among younger adults, density has not [36]. In this study, we examine network size and density of YBMSM

networks as a predictor of problematic loneliness, particularly for networks comprised of close ties that provide socioemotional support to YBMSM.

Sexual Partnership Networks & Loneliness

The sexual partnership network has been associated with increased risk for sexually transmitted infections as it pertains to multiple sexual partners (40-41). Gay, bisexual, and other men who have sexual relationships with men and younger MSM have reported higher rates of multiple partnerships [42-43] though BMSM report fewer sexual partners than their white counterparts [10]. The Loneliness and Sexual Risk Model (LSRM) proposes that sexual risk behavior is an attempt by MSM to address their desire for connection wherein sex acts as a mechanism of "self-medication" to relieve the negative symptomology brought upon by feelings of loneliness [12, 14]. Therefore, in this study, we also examine the relationship between loneliness and the size of the sexual partnership network of YBMSM.

METHODS

The data used in this study were collected from June 2013 to July 2014 as part of the baseline wave of the uConnect study which is a longitudinal study over 18 months inclusive of three assessment periods separated by 9 months from the baseline measures.

A total of 618 YBMSM from the South Side of Chicago were included in the baseline assessment and were recruited through 62 YBMSM seeds who were socially active in the community and likely to bring others like themselves into the study. These seeds were identified from among a diverse group of about twenty socially based organizations who widely interface with YBMSM including representation from: the House/Ball community, online communities, community organizers, youth dance groups, Black fraternities, college campuses, gay families, those involved in sex work industry, gym-based settings, church, clinics, and support groups.

Using Respondent Driven Sampling (RDS), each seed and subsequent recruits were given six coupons each printed with a unique ID number and invited to recruit other YBMSM into the study. Each respondent was offered $60 for participation in the interview and was informed that for each additional recruit who participated they would receive an additional $20. Recruitment occurred between June 2013 and July 2014 and eligibility required participants 1) self-identify as African American or Black, 2) were assigned male gender at birth and 3) between the ages of 16 and 29, 4) report oral or anal sex with a male within the past 24 months, 5) to provide informed consent at the time of the study visit. Of the 62 seeds recruited, 37 successfully recruited at least one additional person; referral chains had a maximum length of 13 and a median of 3 resulting in an overall sample of 618 participants.

Description of Survey & Variables

The survey instrument obtained sociodemographic, sexual health, and behavior data. It also included two separate network generators: an egocentric social (non-sexual) network which will be referred to as the confidant network and a sexual partnership network which rostered respondents' sexual partners in the last six months. Name interpreters were asked regarding the first five confidants and first five sexual partnership network members that were listed. A face-to-face interview was employed because of the heavy cognitive demand of the network enumerations. Computer assisted Personal Interviewing (CAPI) implementation was used by respondents to explicitly confirm matches between "alters" listed in the two network generators used in the survey and confirm alter-alter connections. The confidant and sexual partnership generators and interpreter in addition to the confirming CAPI implementation were approaches modeled after the protocol used in the National Health, Social Life and Aging Project (NSHAP) [44] & National Health and Social Life Survey [45].

Confidant Network Generator

The confidant network was comprised of up to five close others with whom the respondent felt they could talk about things in life or personal concerns deemed important to them. Research studies frequently use name generators of up to five network members for egocentric network surveys [46]. The confidant network generator was administered at the beginning of the interview with the following prompt:

> "In this next section, we will discuss your close social network, that is, the people with whom you discuss things that are important to you. So I can ask some follow-up questions, please list the names of the people with whom you discuss things that are important to you."

If the respondent was reluctant to disclose the actual name or full name, they were invited to use initials, a first name, or nickname. Also, if fewer than five confidants were named or the respondent appeared to have difficulty naming anyone, the interviewer asked:

> "Who else should I add? Please think back to the last time or two you talked with a friend or relative or partner about important things in your life or about personal concerns. Are any of them people you have not yet listed?"

Sexual Partnership Network Generator

The sexual partnership generator was administered midway through the interview for which data on up to six sexual partners was collected. Respondents were given the following instructions:

> "Now I am going to be asking some questions about your sexual activity during the last 6 months, that is since [MONTH of YEAR]. In answering these questions, please include all persons in the last 6 months with whom you had oral, anal, or vaginal sex. By oral sex, we mean stimulating the genitals with the mouth, that is licking or kissing your partner's genitals or when you partner does this to you. By anal sex we mean, when your penis is inside your partner's anus or rectum or your partner's penis is inside your anus or rectum. By vaginal sex we mean when a man's penis is inside a woman's vagina.
>
> "Remember, everything you tell me is confidential. Think carefully over the last six months. Remember to include all partners, a spouse or regular partner as well as anyone you might just have had casual sex with, like a quick hook-up, or someone you shared with another partner, even if you don't know their name. This includes men, women or transgender people. Thinking back over the past 6 months, that is since MONTH, how many people, including men, women, and transgender women have you had sexual activity with, even if only one time?"

That total count of sexual partners was verified with respondents by the interviewer, and the five most recent sexual partners were enumerated in reverse chronology; once participants made their nominations, participants who indicated a current primary sexual partner were prompted with a follow-up question inquiring whether that partner had

already been nominated; if the primary partner was not among the five sexual partners listed, that name was added as the sixth.

Dependent Variable: Problematic Loneliness

Loneliness was measured from a single item from the Brief Symptom Inventory-18 (BSI-18), an 18-item self-report assessment of psychological symptoms experienced over the previous week [47-48]. The item asks: "How much has 'feeling lonely' distressed or bothered you in the past 7 days, including today?" The responses included "not at all" "a little bit" " moderately" "quite a bit" and "extremely." The variable was transformed into a binary dummy variable; responses in the category of not at all, a little bit, and moderately was described as a less problematic loneliness, and responses of quite a bit, and extremely were characterized as 'problematic loneliness.'

Independent Variables: Network Structure

MSM Network Size

The size of the respondent's MSM network was defined by the respondent's estimated number of other men who have sex with men respondents (1) knew and (2) with whom they communicated on a regular basis. This measure included MSM with whom respondents may have been sexual and non-sexual network members as well as MSM who may or may not have been listed in their core discussion/confidant network or their sexual networks. An analysis of the frequency distribution revealed outliers in the estimates of

the MSM Network size; the variable was truncated at 100 which connoted the highest reports of MSM network size.

BMSM Network Size

Respondents were prompted to estimate the number of BMSM between the ages of 16 and 29 whom they knew well on a first name basis, and with whom they were likely to have contact within the following two weeks. Similar to the MSM network size, the BMSM network size had outlier estimates. Thus, the variable was truncated at 50 BMSM based on an analysis of the distribution frequency.

Confidant Network Size

The confidant network size was the total number of individuals the respondent identified as feels close to and whom the respondent discusses things of importance. Up to five individuals could be identified, and there was no other restriction on characteristics of potential network members (i.e., irrespective of gender identity, sexual orientation, race/ethnicity, age, type of relational tie, etc.). Alters in this network were referred to as 'confidants.'

Confidant Network Density

Confidant network density was the measure of the proportion of actual ties between confidants in the network among the total number of potential ties between confidants.

Prompted by the instruction to indicate which alters rostered in the alter slots knew each other, respondents used a visual screen to report known alter-alter connections (To your knowledge, does [alter 1] know [alter 2]?). Network density ranges from 0 to 1, the number 1 reflecting a network in which all potential connections between confidants were actual connections.

Sexual Partnership Network Size

The size of the sexual partnership network was defined by the number of sexual partners in the previous six months, up to five sexual partners and included the main or primary sexual partner as the sixth if not listed among the five most recent. Sexual partners included women, men and transgender identified individuals with whom respondents had oral, anal, or vaginal sexual contact.

Additional Covariates

In addition to measures of the networks, a range of ego-level demographic and socio-structural factors were collapsed into binary variables; they were described in the Methods section of an earlier paper). Covariates measured: age, relationship status (single vs partnered), income insufficiency in the last six months, homelessness in the last 12 months, education (college degree vs high school or less), current student status, self-report HIV status, gender identity (transgender vs cisgender), participation in giving or receiving sex in exchange for money, drugs, shelter, or other goods, and having a main/primary sexual

partner (i.e., “a person you have sex with and feel committed to above anyone else; this is a partner you call your boyfriend/girlfriend, significant other, spouse or life partner”); the latter two, main/primary sexual partner and participation in sex exchange, were only used in the sexual partnership network adjusted model. For the majority of these covariates, previous analyses in this study determined their association with problematic loneliness; therefore, they were selected for theoretical relevance in the adjusted analyses to examine the relationship with structural network factors and problematic loneliness.

Statistical Analysis

First, descriptive analyses were conducted to describe characteristics of YBMSM in the sample and prevalence of loneliness in the sample. Frequency distributions of network size were visualized to identify influential points and outliers. Outliers were truncated for the MSM and BMSM networks. Scatterplots were used to visualize the relationship between networks and loneliness. Visual inspection of plots prompted consideration of spline modeling to linearize the relationship of loneliness with MSM and BMSM networks. Based on statistical significance ($p < 0.05$) discovered during stepwise spline modeling, those variables were inserted into the final model for that network. Conversely, the BMSM network did not yield significant splines, and so it was concluded that the effect of BMSM network size was linear and did not require spline modeling.

Bivariate associations were first conducted before adjusting models with socio-structural and demographic covariates which were chosen based on their theoretical influence on network size and structure and their relationship to loneliness. Multivariate logistic regression analyses were then conducted to examine the relationship between loneliness and the structure of networks; first, the base model was applied to models with the network factor and loneliness. For the sexual partnership network, it was observed that when adjusting the model with a splined MSM network size, the size of the effect was no longer statistically significant in the model. To more fully understand the impact of MSM network size on sexual partnership and loneliness, a forward stepwise selection process was applied in which each covariate was added to the predictor and dependent variable. The Generalized Estimating Equation approach provided robust standard errors to account for correlated observations among respondents who were referred into the study by peers in their network. Missing data accounted for less than 10% among all relevant variables and were treated as missing at random. All statistical analyses were conducted using Stata 15. A two-tailed p-value of less than 0.05 was considered statistically significant and p-values greater than 0.05 and less than 0.10 were considered marginally statistically significant.

RESULTS

Baseline characteristics of the sample are shown in Table 4-1. There were 609 participants who provided a response to the loneliness item. Approximately 8% identified as transgender and over 93% reported their sexual identity as gay or bisexual. The average

age of respondents was 22.8 years. Approximately, 61% of YBMSM reported their relationship status as single with over three-quarters of the overall sample indicating they had a main or primary sex partner. Over 13% of YBMSM reported involvement in the sex exchange economy, which included giving and/or receiving sex in exchange for money, drugs, shelter, or other goods. Self-reported HIV serostatus prevalence for the sample was 24%. Several socioeconomic characteristics were measured; 43% of YBMSM experienced income insufficiency in the last 6 months, and 6.7% reported homelessness over the last 12 months. Approximately 45% of the sample had post-secondary education, 16% attained a college degree, and 32% of the sample were current students. Problematic loneliness was reported by 19% of YBMSM who described "quite a bit of" and "extremely" distressing and bothersome loneliness over the previous week.

The mean size of MSM networks, inclusive of MSM whom YBMSM communicate or have regular contact, was 13 MSM and a median of 5 MSM (SD=20.8). A scatter plot graph of the probability of problematic loneliness and the MSM network size revealed a non-linear relationship. Spline modeling was used to improve the linearity of the variable to improve fit and give the curve freedom to more closely follow the data. Spline modeling showed that beyond 10 MSM added to the network, the slope between loneliness and size changed so that there was almost no effect of MSM network size on loneliness. Approximately 64% of the sample reported networks under 10 MSM with whom they were in regular communication, and 36% reported MSM network sizes of 10 or more.

The BMSM network was comprised of an estimated number of Black MSM between the ages of 16 and 29 who were "known well" (on a first name basis) by the YBMSM respondent and with whom the respondent anticipated contact over the next few weeks. The average size of this network was 8.9 (SD=10.1), and the median network size was 5, similar to the median size of the MSM network. Graphic visualization confirmed the linearity of this variable, and so the variable was treated as a continuous variable without transformation.

Egocentric confidant/core discussion networks were comprised of individuals YBMSM considered close and with whom they typically discussed things of importance. Core discussion networks as a type of network are widely assumed to represent strong, close ties that are a subset of a person's typical interpersonal environment for the transmission of information, influence, and support [49]. The mean network size for confidant networks was 2.5 with a median size of 2 out of a maximum of five alters that could list. Over 1/3 of YBMSM reported confidant network sizes of 2. Close to 20% reported confidant network sizes at the upper bounds of the network size of 4-5 alters. The network density mean for this sample was 0.69 (SD=0.38). The size of the ego respondent's sexual partnership network was on average 2.6 and had a median size of 2 out of a maximum of six rostered sexual partners over the previous six months. About half (53%) of YBMSM reported

sexual networks ranging from the size of 0-2, and approximately 21% reported 5-6 sexual partners in the last 6 months.

Structural Network Factors & Problematic Loneliness Regression Models

Tables 4-2 through 4-4 show multivariate logistic regression models of problematic loneliness on structural aspects of various networks. Covariate factors of age, student status, and a main or primary sex partner were not associated with problematic loneliness in the base models of the networks. Reporting any partnered relationship was protective against problematic loneliness with evidence of reduced probability across all network models ranging from 52%-59% decreased likelihood. Income insufficiency retained significance in each network model and was associated with between 65-67% probability of problematic loneliness. Homelessness in the last 12 months, a measure of housing stability, retained statistical significance in each network model revealing roughly two-fold greater odds of problematic loneliness across all models. Network models that include HIV seropositivity produced an average 69% probability of problematic loneliness for HIV positive YBMSM across all models. Having a college degree resulted in statistically significantly greater odds of problematic loneliness in the confidant network (AOR=1.95, CI=1.05, 3.42) and marginally significant ($p<.10$) increased odds for college degree earners in both MSM networks. Participation in sex exchange was added to the sexual partnership model because of its potential confounding influence on the size of the sexual partnership

network, and this factor was found to have marginal significance with increased odds of problematic loneliness in that network.

Model 1 analyzed the relationship between loneliness and estimated network size of the MSM network of YBMSM adjusting for the base model which included the following variables: age, social stability factors of relationship status, income insufficiency, homelessness, educational attainment, current student status, HIV health, and gender identity. Spline modeling of the MSM network with problematic loneliness resulted in selecting "knots" at network sizes of 10, 50, and 70; however, only 10 and 50 showed statistically significant effects of the spline and were included in the adjusted model. A bivariate analysis showed that networks below 10 MSM were 12% more likely to report problematic loneliness per MSM added to the network up to 10 MSM (AOR=1.12, CI=1.03-1.22). For networks of more than 10, the effect of MSM network size on loneliness decreased by 89% resulting in relatively little to no change in the odds of loneliness per additional member reported in the MSM network beyond a network size of 10 MSM; the change in odds was statistically significant (AOR: 0.89, CI= 0.81, 0.97) resulting in an odds ratio that reflects little to no change per additional MSM added to the network beyond 10 (OR=.995). Furthermore, there was no main effect of MSM network size on loneliness after 50 MSM were added to the network.

Model 2 examined the size of BMSM networks comprised of other YBMSM between the ages of 16 and 29 whom respondents said they knew on a first name basis and were likely to have contact within the following two weeks. We found an increase of 4% in the odds of problematic loneliness per each additional BMSM which was roughly a 1-2% probability of loneliness per additional BMSM (AOR=1.04, CI 1.02, 1.07).

The third regression model shown in Table 4-3 analyzed the relationship between problematic loneliness and the size and density of the confidant networks of YBMSM. Adjusting for the base model, we found 36% greater odds of problematic loneliness per additional confidant member of the network, but an opposite effect was found for density which was associated with reduced odds of loneliness by roughly half the odds as per unit increase; that effect was marginally statistically significant (p=0.08), however.

Regression model 4 examined sexual partnership networks controlling for factors in the base model in addition to reports of a main or primary sex partner and participation in the sex exchange economy. In the sexual partnership network, we found a 16% increase in the odds of problematic loneliness per sexual partner in the network (AOR=1.16, CI 1.03, 1.31). Further controlling for size of the MSM network, results showed that MSM networks under 10 reduced the magnitude of the effect of the number of sexual partners slightly to 15% greater odds of problematic loneliness per sexual partner; however, inclusion of both MSM network splines (under 10 and over 10 MSM in the network) eliminated the effect

of sexual partnership network size on loneliness altogether. That is to say, per additional sex partner, odds of loneliness increased by 15% until more than 10 MSM in the network; beyond 10 MSM, the relationship between sexual partners and problematic loneliness was suppressed.

DISCUSSION

In this study, we examined structural aspects of several types of networks, specifically size, density, and network type, to investigate how structural aspects of various networks were related to the experience of loneliness among YBMSM. The goal of the study was to examine risk for loneliness associated with structural network factors within the sexual and non-sexual social networks of YBMSM.

The filtration model depicts a conceptual model of the relationship between loneliness and social networks to produce health outcomes [cf. 50]. The model proposes upstream socially ascribed characteristics, and social and cultural forces move downstream to proximal factors leading to loneliness. Hawkley et al. [33] tested aspects of this model with older adults, concluding that structural aspects of the network such as size and density, which influence social and interpersonal behavior, social contacts, and relationship quality, act as the "ultimate arbiters of the influence of distal factors" on more proximal factors resulting in loneliness [51].

Accordingly, we found that increased size of MSM, BMSM, and even confidant networks was associated with more distressing feelings of social isolation. Even for networks of sexual identity and racial homophily (i.e., MSM and BMSM networks), we found that having more people in YBMSM's network, effectively reducing objective social isolation, may not be a sufficient condition to protect against problematic loneliness. Noteworthy, it has been encouraged that inducing increased social network size promotes engagement and retention in HIV care and the quality of life for YBMSM [52]; however, though the literature favors the finding that larger networks provide access to more resources and promotes better health [53-56], there may be a different mechanism involved for YBMSM who are lonely.

Loneliness & Structure of Core Discussion Network

The core discussion/confidant network, comprised of ties that provide socioemotional support, has been theorized to exclusively represent strong, close ties. Accordingly, we hypothesized that having a larger number of ties, indicative of greater availability of and access to emotional social support, would offer more opportunities to achieve congruity with desired and adequate levels of social interaction for YBMSM, thereby reducing loneliness; the data did not support that prediction. Contrarily, each additional member of the confidant network resulted in a 36% increased likelihood of problematic loneliness.

Small [57] introduced a counterclaim to the widely assumed strong ties theory of core discussion networks in his study concludes that they are actually comprised of a mix of weak and strong ties—people whom respondents did not necessarily consider *personally* important though they may provide social support; moreover, Small [57] suggested that determining whom to discuss important matters with is based less on personal closeness, but dependent upon perceptions of (1) how knowledgeable the contact is about the topic, (2) their availability as well as (3) the opportunity afforded by a given social context. Thus, corroborating Small [57], our finding may suggest that the size or volume of networks of this type may not necessarily reflect the kinds of ties essential to mitigate loneliness. Alternatively, it may be that the socioemotional support available in those confidant networks was not fully mobilized in a way that would relieve loneliness.

Conversely, we found that increased density of core discussion networks was protective against problematic loneliness possibly due to higher social connectedness and embeddedness of YBMSM in their social support network. Though this finding achieved only marginal statistical significance, suggesting that perhaps having confidants who are tied to each other creates a social-connection-safety-net for YBMSM. More dense networks facilitate maintenance of the status quo and provide security and stability. Indeed, studies have found that people with denser networks are happier [58].

We found that a larger number of individuals in the networks exacerbated loneliness despite racial and sexual identity homophily and increased volume of social support resources. On the other hand, greater connectedness of ties within the social support network (alters who know alters) provided protection against loneliness. Hence, for networks of YBMSM having *things* in common with people (such as sexual identity, race, disclosures of important topics) may not be as important to reduce loneliness as having *people* in common as manifested in high density networks.

Loneliness and Size of MSM & BMSM Networks

The effect sizes of MSM (12%) and BMSM (4%) networks per additional member to the network were relatively small, possibly related to weak correlations between loneliness and objective social isolation (network size) described in the literature [78]. Findings from this study are aligned with results found among both young and late middle-age adults that reported a desire for more people 'get together with' in their networks reported more lonely days [5]. Results further indicated that the size of the MSM network was associated with problematic loneliness for smaller networks under 10 MSM, but for larger networks that effect changed to little or no effect on loneliness. Knowing less than 10 MSM versus more than 10 might be characterized as a more objective social isolation experienced by YBMSM that provokes loneliness. However, at a size above the threshold of 10, the effect of size of MSM network is muted. Interestingly, in a Finish study that had a 15-20 year follow-up found that having up to 10 members in the social network of participants

measured at baseline was associated with persistently more unhealthy risk behaviors over the adult life course compared with respondents who had greater than 20 members at baseline [59].

Another consideration potentially explaining the relationship between larger networks and problematic loneliness may be that increasing network size may have the unintended consequence of proliferating a lack of trusting relationships in the network making it more difficult to achieve desired relationship sufficiency [60]. People who interact with large numbers of people tend to have less focused time to spend with each of them [61]; deeper social relationships come at a higher cost compared with more shallow relationships [62]. As McPherson, Smith-Lovin and Brashears [63] succinctly characterized:

> "the inexpensive ease with which we can now contact others without regard to physical distance has expanded the size of our personal social systems, but possibly at the cost of intimacy (p. 679)."

The problem of the lonely may not simply an issue of not having enough contacts or socializing with more people; conventionally, most would assume that alleviating loneliness simply requires going out and meeting more people. However, larger networks for YBMSM potentially exacerbate perceptions of inadequately met desires for social connection resulting in greater emotional distress. An even more curious paradox is that while among the aged the loss of ties has been associated with loneliness, the problem of

loneliness among younger racial and sexual minority males seems to be associated with increased network size—an interesting observation given that network growth is typical of the young adulthood developmental stage compared to shrinking networks as one ages [35,64]. Future research is needed to further understand the life course perspective in the development of YBMSM, particularly as it might intersect with the development of their sexual identity.

Larger networks have been associated with extraversion personality type; however, extraverts have not been found to be emotionally closer to individuals in their network after controlling for network size [65-66]. So, it may be that MSM, BMSM, and confidant network growth may be partly influenced due to sociable personality traits of YBMSM; nonetheless, despite their extraversion, they may still suffer from loneliness particularly outside of the awareness of others. Notably aligned with this perspective, it is possible that YBMSM with higher levels of disclosure have larger networks because they are out to more people but incur penalty through the greater experience of social rejection in other settings due to the stigma of being out. In a qualitative study of a small group of YMSM, one participant described his effort to dispel the feeling of loneliness by building a larger social network to resolve the desire to feel socially connected [14]:

"need to feel popular…If I don't have a lot of friends to hang out with when I want to, then I'm just a nobody," one of the participants reflected.

Structure of Sexual Partnership Network & Loneliness

We also found evidence in the unadjusted bivariate model that the number of sexual partners in the sexual partnership network was modestly associated with problematic loneliness. Each additional sexual partner added resulted in 1.16 times greater odds of problematic loneliness. That relationship, however, seemed to be moderated by MSM network size of over 10 individuals. When fewer MSM were known (less than 10), however, the effect of sexual partnership network size maintained its association with problematic loneliness. The mechanism of this effect suggests that knowing fewer MSM (a relative objective social isolation) provoked loneliness in such a way that it prompted efforts to meet the desire for connection by having more sexual partners, but a larger MSM network seems to disrupt that mechanism as described in the loneliness sexual risk model as it pertains to multiple sexual partners.

Results may support the notion that perceived social isolation is a relevant factor underlying the sexual risk of multiple sexual partners among YBMSM albeit each sexual event may have involved condom use. Nonetheless, poorer psychosocial function measured by increased depressive symptoms among YBMSM has been shown to be related to motivation to forego the use of condoms to achieve an emotional connection [80]. Interventions could explore opportunities to help YBMSM most distressed and bothered by loneliness to manage feelings of loneliness in ways that interrupt the active cycle of sexual risk behavior described in the adapted LSRM [14] such as the use of cognitive-

behavioral therapeutic approaches or mindfulness training [67-68]. Interestingly, given deficits in social skills as well as anxiety over those deficits [76], and interpersonal communication deficits [77] that accompany loneliness, future research might explore whether loneliness impedes safer sex and condom negotiation, and raise thoughtfulness about individual level intervention strategies for YBMSM challenged by loneliness in a way that debilitates their social competency to do so. Hubach et al. [14] recommend that social service and public health professions develop programs that promote community building, relationship building and promote healthy self-reflection—potentially a more meaningful approach than only increasing the number of social contacts.

Study Limitations

The findings from this study should be considered in the context of several limitations. One includes the use of a single-item indicator to measure loneliness extracted from the Brief Symptom Inventory-18. While several studies in the loneliness literature have used single-item or direct measures of loneliness, especially in epidemiological studies [cf. 69-73] use of a scale has been recommended to allow for a more thorough psychometric analysis to confirm the reliability and validity of the loneliness measure. Nonetheless, the single-item measure used in the study has strong face validity in that it asks how bothered or distressed by loneliness the respondent has been over the past week, bringing attention the role and importance subjectivity in social relationship assessments. However, while loneliness may

be problematic for YBMSM, we do not necessarily know how respondents may define loneliness.

Additionally, social desirability bias and mood or mental health status of the respondent could have influenced reports of loneliness and the estimated size of networks. Expansiveness bias is a type of systematic error in the measurement of network size that occurs in the over/underreporting of others in the network which may distort findings related to the size, range, and density of personal networks [74]. Certainly, participants are likely to not report all relevant interactions in their estimates of network size, but if misreporting is random those with many interactions should tend to report more interactions and those with few should report fewer [74].

There are limitations related to the confidant and sexual partnership generators. Responses may be biased because of poor recall. Also, network enumeration was restricted to reduce the burden on participants so a less comprehensive capture of the networks of YBMSM may have been measured, which limits the insight this information provides about the respondent's position within a broader social structure; however, we found that results were consistent when we analyzed network size among three different networks representing a range of fixed choice and free choice generators. There is also evidence that estimates of network size and estimates of social connection can be sensitive to interviewer effects of training and fatigue [75].

CONCLUSION

As studies of loneliness continue to provide conceptual clarity regarding the experience of loneliness, results from this study corroborate findings of a distinction between perceived social isolation and objective social isolation in the networks of YBMSM. Moreover, that loneliness can be experienced by YBMSM despite multiple social ties; it is not possible to discern a person's experience of loneliness based on how many people they know. Thus, it is likely that resolving and intervening on loneliness requires more than merely increasing network size and the number of contacts rather strategies that enhance relations among and within the networks of YBMSM are likely more impactful. The findings also suggest that loneliness may be associated with HIV/STI sexual risk behavior among YBMSM as it pertains to risk related to larger sexual partnership networks. Qualitative studies would be particularly helpful to further give voice to YBMSM's articulation regarding the specific context of their social relationships and social experiences of loneliness.

TABLES AND FIGURES

Table 4-1. Baseline socio-structural and network characteristics of YBMSM from the uConnect Chicago study cohort 2013-2014.

Respondent Characteristics		(%) mean/median (SD)
Age		22.8 (3.1)
16-18		8.9
19-24		68.8
25-29		22.3
Transgender identity		7.8
Relationship Status- Single		60.3
Main/Primary Sex Partner		76.5
Low Income (<$20, 000/yr)		81.8
Income Insufficiency (Last 6 months)		43.3
Homeless (Last 12 months)		6.7
Education: Associates Degree or higher		15.7
Current Student		32.0
Sex Exchange (giving/receiving)		13.3
Self-report HIV+		24.0
Problematic Loneliness		18.9
Network Factors		
MSM Network Size		13.3 (20.8)/ Median=5
	0-10	63.6
	10+	36.4
BMSM Network Size		8.9 (10.1)/ Median=5
	0-10	69.1
	10+	30.9
Close Confidant Network Size		2.5 (1.2)/ Median=2
	None	3.1
	1	16.5
	2	33.3
	3	27.8
	4	9.6
	5	9.7
Close Confidant Network Density		0.69 (0.38)/ Median=0.83
Sexual Partnership Network Size		2.6 (2.57)/ Median=2
	None	2.9
	1	31.7
	2	21.2
	3	14.7
	4	8.6
	5-6	20.9

Table 4-2. Structural network factors in MSM and BMSM networks that predict loneliness among YBMSM ages 16-29.

	Model 1: MSM Network n=592	Model 2: Black MSM Network (anticipated contact next 2 weeks) n=595
	Adjusted odds ratio (95% C.I.)	Adjusted odds ratio (95% C.I.)
Age	0.99 (0.91, 1.08)	0.99 (0.91, 1.08)
Partnered Relationship	**0.45 (0.28, 0.72)***	**0.48 (0.30, 0.75)***
Transgender Identity	1.38 (0.77, 2.45)	1.25 (0.68, 2.30)
Income Insufficiency	**2.05 (1.37, 3.08)***	**2.03 (1.32, 3.14)***
Homelessness	**2.16 (1.33, 3.50)****	**2.20 (1.39, 3.50)***
College Degree	1.83 (1.05, 3.42)***	1.80 (0.92, 3.10)***
Current Student	1.22 (0.85, 1.76)	1.15 (0.80, 1.66)
Self-report HIV+	**2.19 (1.33, 3.58)****	**2.21 (1.36, 3.59)***
Network Factors		
MSM Network Size		
0-10	**1.12 (1.03, 1.22)****	
10+	**0.89 (0.81, 0.97)**	
BMSM Network Size		**1.04 (1.02, 1.07)***

* p-value ≤ 0.001; ** p-value ≤ 0.05; ***p-value ≤ 0.10

Table 4-3. Structural network factors in core discussion and sexual partnership networks that predict loneliness among YBMSM ages 16-29.

	Model 3: Core Discussion Network (Close Others/Important Topics) n=596	Model 4: Sexual Partnership Network (Last 6 months) n=573
	Adjusted odds ratio (95% C.I.)	Adjusted odds ratio (95% C.I.)
Age	1.00 (0.92, 1.09)	1.00 (0.99, 1.01)
Partnered Relationship	**0.45 (0.29, 0.70)***	**0.46 (0.28, 0.76)****
Main/Primary Sex Partner	-	1.03 (0.61, 1.75)
Transgender Identity	1.38 (0.79, 2.43)	1.28 (0.63, 2.61)
Income Insufficiency	**1.98 (1.30, 3.02)***	**2.16 (1.43, 3.24)***
Homelessness	**2.23 (1.41, 3.57)***	**1.91 (1.19, 3.07)****
College Degree	**1.95 (1.08, 3.53)****	1.59 (0.87, 2.89)
Current Student	1.23 (0.85, 1.77)	1.26 (0.88, 1.81)
Self-report HIV+	**2.21 (1.34, 3.63)****	**2.26 (1.37, 3.74)****
Sex Exchange	-	1.70 (0.91, 3.13)***
Network Factors		
MSM Network Size		
0-10	-	**1.12 (1.02, 1.23)****
10+	-	**0.89 (0.81, 0.98)****
Core Discussion Network Size	**1.36 (1.10, 1.68)****	-
Core Discussion Network Density	0.49 (0.23, 1.07)***	-
Sexual Partnership Network Size	-	1.10 (0.97, 1.25)

* p-value ≤ 0.001; ** p-value ≤ 0.05; ***p-value ≤ 0.10

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CHAPTER FIVE

Manuscript 3

Collective Social Identity Attachment

& Loneliness Among YBMSM

ABSTRACT

Background: Social relationships provide us with opportunities to meet needs for belongingness and assist us with meaning making in life. Loneliness is experienced as a state of emotional distress that occurs when an individual interprets their social world as having insufficient social and emotional connections. Just as dyadic interpersonal relationships are critical to our health and existence, so too are social groups essential determinants of psychological and physical well-being, and particularly the extent to which we feel a sense of attachment and connection with the group's social identity has implications for health. Social identity and social identification with groups, subjective dimensions of social integration, has been identified as a key mechanism in processes leading to health. The literature on the mental and physical health benefits as well as risks associated with group social identity point to a potential role of a social identity approach in meeting social needs of connection and belonging; however, an analysis among young Black MSM (YBMSM), who may have attachments to marginalized and stigmatized group social identities (i.e., closeness to Black and gay communities), has not been widely investigated.. More specifically, the literature lacks attention to how close attachment to those communities may promote a perceived sense of social isolation (loneliness) or connectedness.

Objective: The objective of the study was to examine the effect of close emotional attachment to social identity groups on loneliness, specifically close attachment to the

"Black community" and the "gay community.".The study considers whether emotional attachment to group social identity of stigmatized identities is associated with feelings of loneliness and considers the health implications thereof.

Methods: Using a respondent driven sampling approach, data from the uConnect study, of YBMSM, were collected from 618 respondents with primary residence on the South Side of Chicago. We measured closeness to the "Black community" and "gay community" to assess the strength of group-based identity and provided descriptive statistics of their response by individual and social factors. We then conducted logistic multivariate analyses adjusted for those individual and social factors to examine the effect of social identity on loneliness.

Results: A paired t-test comparing mean responses of closeness to 'the Black Community" and "the Gay Community" showed that YBMSM reported greater closeness with Black communities compared with closeness to gay communities, t(614)= -12.17, p=. 001. The descriptive analysis provided reveals variations in responses of closeness to both communities by socio-structural factors and other network factors. For example, YBMSM who indicated the strongest attachment to the gay community reported a higher mean of MSM in their network, m=20.4 (28.8) compared to the mean size of the MSM network among those with the strongest feelings of closeness to the Black community, M=13.5 (22.1). Also, unstably housed YBMSM reported slightly greater closeness with the gay

community (72.2%) compared with stably housed MSM over the last year (64%). Separately analyzed, closeness to Black and gay communities was independently associated with reduced odds of problematic loneliness among YBMSM. Additionally, reporting multiple social identity inclusive of close attachments to both communities provided an even greater magnitude of protection against loneliness.

Conclusion: As strategies and interventions to improve the health of YBMSM are developed, our results suggest that they could benefit from mobilizing Black and gay group social identities to bolster social connectedness. Future research that determines the utility of a group social identity approach to support HIV prevention, engagement, and retention in care—to the extent that it improves psychological and social well-being—is encouraged.

BACKGROUND

Loneliness is experienced as a state of emotional distress that occurs when an individual interprets their social world as having insufficient social and emotional connections [1]. A sense of belonging—a state counter to loneliness—deemed essential for human survival, entails close emotional ties with others [2-3]. Loneliness, however, occurs when an intrapsychic pain is felt, not unlike that of hunger or thirst, resulting from perceived incongruity between actual and desired levels of social interaction, thwarting fulfilment of social needs associated with belonging [1]. As dyadic social relationships are critical to human existence and health, particularly in the context of loneliness, social groups too are

essential determinants of psychological and physical well-being [4-6]. Yet, the literature typically describes the influence of close social relationships on health with a predominant focus on social interactions vis-à-vis dyadic relationships (between the focal person and another individual) [7]. Less attention has been given to how expectations of the desired quantity and quality of close ties, prescriptive of loneliness, may extend to one's social identity group-based affiliations [5]. Jetten et al. [4] signified the importance of the latter by noting that,

> "Achieving and maintaining health is not simply a responsibility that falls on the individual [but] lies just as much in the hands of the various collectives to which the individual belongs (p.1)."

This paper explores the idea that one's sense of attachment with marginalized social identity-based groups, as a large-scale network entity, may have implications for loneliness among Young Black men who have sexual relationships with men (YBMSM).

Loneliness, Social Identity & Health

Not only has loneliness been shown to undermine psychological and emotional well-being, but the impact of loneliness can be deleterious to one's physical health [8]. Evidence from a meta-analysis of early mortality risk demonstrated that loneliness increased the likelihood of all-cause mortality, controlling for depression, by 26% over a follow-up of 7.1 years [9].

Loneliness has also been associated with negative health outcomes in psychosocial and emotional health [10] including increased symptoms of depression [11-12], suicidal behaviors [13], and alcohol abuse, and among men who have sex with men (MSM) sexual risk behavior mediated through substance use and compulsive behavior [14].

A growing body of research also connects social identities and social networks to mental and physical health as well [15]. Social identity refers to the aspect of one's self-concept derived from belonging to certain social group(s) and the emotional value attributed to their membership [15]. Strong social identity has been shown to improve mental and physical health [6, 16-17], and reduces loneliness [18]. Social identity has been framed as the subjective dimension of social integration, which measures the frequency of interactions or the amount of social contact and participation in social activities; though social integration measures tend to not include a group identity dimension, there is evidence that group identity (social identity) predicts mental health better than social contact [19]. Such findings have underscored the recommendation that communities and practitioners consider developing interventions that capitalize on social identity to reduce loneliness and improve health [16].

<u>On Social Identity & Loneliness among MSM</u>

Closeness and connectedness to Black and gay communities have been studied as a relevant large-scale group or network dimension impacting the health of Black MSM

(BMSM) who "often negotiate multiple minority identities [20]." Intersections of race, gender identity, sexual behavior and sexual identity present complex issues for YBMSM due to potential competing primacy of racial vs sexual identity [21]. Behaviorally and socially identified Black LGBT individuals may experience conflict in their affiliations with gay communities because they have perceived the historical exclusion of their racial identity group [22-24], not to mention the struggle of negotiating sexual identities within Black communities [25]. For some Black gay men, racial identity takes precedence over gay identity [26].

Attachments to social identity groups partially functions to engender a sense of belonging. Research indicates that a low sense of community belongingness among MSM is associated with increased risk for loneliness [27-28] and is tied to poorer mental and physical health among sexual minorities [29-31]. Less fully characterized in the literature, however, is the extent to which an individual's feelings of closeness specifically to a social identity group can either enhance or diminish social connectedness among those uniquely vulnerable to loneliness, such as YBMSM, because they hold marginalized and stigmatized social identity group attachments.

Social group identification refers to the process by which an individual perceives a sense of belonging and psychological attachment to a social identity group; it enables definition of the self-concept which can materialize through shared emotions, beliefs, interests, and

behaviors consistent with the social category of identity [32-34]. Membership that is established through close affiliation with social categories of identity, indirectly and directly, exposes individuals to shared social contexts and networks containing similar social influences and resources that can influence behavior in ways that may not be apparent [35-38].

To date, the literature includes an examination of how group social identity uniquely manifests among socially disadvantaged groups, as costs associated with group membership have been identified when social identity negatively frames outgroup experiences [39]. Despite facilitating bonding with similar others, social identity can augment perceptions of difference from outside groups resulting in higher stress and poorer health [4, cf. 40]. Nonetheless, just as shared group membership ties the individual to the conditions of groups to which they belong with potentially negative ramifications, it can also be enriched to promote healthy outcomes through inter- and intra-group ties to increase a sense of belonging, meaningfulness, and self-efficacy [41-43].

Study Rationale

Scientists studying loneliness have urged that reducing loneliness requires consideration of social and cultural factors [9, 44]. As a further endorsement, social psychologist researchers Deaux and Martin [36] have recommended, “To overcome the structural constraints that limit one’s choices in the formation of everyday relationships,” as can

happen in the experience loneliness, “people form attachments to large-scale social categories...[as they] may provide forms of self-expression and self-evaluation that reach beyond the immediate context and offer important sources of motivation [toward self-efficacy] [36, p. 108).”

Having found that individual-level factors are insufficient to explain higher incidence of HIV among BMSM [45], researchers too have directed attention to social contextual factors such as community connections to consider additional drivers of HIV infection and opportunities toward the elimination of the HIV epidemic among BMSM. As the literature attests, YBMSM are a population for whom new effective and culturally appropriate HIV prevention and care strategies are essential [46]. To that end, this study is anchored by the consideration that attention to a social identity approach for YBMSM, especially within the context of public health intervention and community mobilization efforts, may reduce loneliness and thereby facilitate greater social connectedness to promote health and well-being.

Group closeness in the current study was used as a proxy for the strength of group social identity with racial (“the Black community”) and sexual identity (“the gay community”) communities. It was hypothesized that YBMSM expressing closeness with “the Black community” may perceive less social isolation, measured as problematic loneliness, but that benefit may not be experienced by YBMSM with closeness to “the gay community.”

Alternatively, we hypothesized that closeness with both could reduce feelings of loneliness as there is evidence that multiple important group memberships boost psychological health independent of the number of interpersonal ties established within those groups [43].

METHODS

Setting

Baseline data were collected from June 2013 to July 2014 for the uConnect study, a longitudinal population-based study which aims to examine factors associated with HIV risk and transmission in the sexual and non-sexual social networks of YBMSM within South Chicago and adjacent south suburbs. A total of 618 YBMSM from the South Side of Chicago were included in the baseline assessment.

Study Participants

A diverse group of twenty organizations who widely interface with YBMSM were invited to a meeting in 2014 conducted by University of Chicago researchers during which the objectives and importance of the study were shared. Each attendee was asked to nominate three YBMSM who were socially active in the community and likely to bring others like themselves into the study which resulted in a diverse group of 62 seeds recruited from twenty community partners.

A respondent driven sampling approach was used to recruit participants who were given six coupons to recruit other YMSM they know into the study. Each participant was offered $60 for participation in the interview and offered $20 per each additional recruit. Eligibility criteria included 1) self-identified as African American or Black, 2) assigned male gender at birth, 3) between the ages of 16 and 29, 4) reported having had oral or anal sex with a male within the past 24 months, and 5) were willing and able to provide informed consent at the time of the study visit. The study protocol was approved by the Institutional Review Board of NORC at the University of Chicago.

Measures

Social Identity

The primary independent variable was "Closeness of Ties with Black & Gay Communities." Community closeness reflects cognitive and affective components of affiliation or group identity [20, 49]. In a previous study by Williams, Spencer and Jackson [50] exploring race, the stress of discrimination, and physical health outcomes they used the racial closeness item to assess the strength of racial group identity using a 4-point response scale ranging from very close to not close at all, with higher scores indicating a greater sense of closeness in community connectedness. Following Williams et al. [50], Frost and Meyer [49] used the single item to assess closeness in respondents' feelings to their racial group; their study added group-based identity associated with sexual orientation (i.e., "the gay community")

The items used in this study mirror the items used by Frost and Meyer [49] and Hotten et al. [20] in their study on community connectedness among sexual minorities:

3. How close do you feel to the gay community? Would you say…
4. How close do you feel to the Black community? Would you say…

Response options included "very close," "somewhat close," "not very close," and "not close at all." Response options were collapsed to create a binary response of close (inclusive of very close and somewhat close responses) vs not close (inclusive of not very close and not close at all responses). Additionally, to assess affiliations that were inclusive of black and gay communities together, the two single items were combined in the analysis to form the following pairings: feelings of closeness to both; closeness to Black, not gay; closeness to gay, not Black; closeness to neither.

Limitations of 'single identity axis thinking' in public health, a shortsightedness of characterizing identity through a singular dominant identity rather than by the intersections of multiple identities, have been well ascertained by Bowleg et al. [51]; most notably, that mutually exclusive, single identity frameworks underappreciate the critical reality of multiple interlocking social identities which produce inequities at various levels [cf. 51-53]. To better appreciate the multiplicity of identities we also analyzed group closeness as combinations of the two social identity groups.

Loneliness

The dependent variable, problematic loneliness, was measured from a single item captured from the Brief Symptom Inventory-18 (BSI-18), an 18-item self-report assessment of psychological symptoms experienced over the previous week [54-55]. One of the items from that scale asks: "How much has 'feeling lonely' distressed or bothered you in the past 7 days, including today?" The responses included "not at all" "a little bit" " moderately" "quite a bit" and "extremely." Responses to that single item were collapsed into a binary dummy variable; responses in the category of not at all, a little bit, and moderately were described as a less problematic loneliness; and responses: quite a bit, and extremely were characterized as a more 'problematic loneliness'.

Additional Covariates

Data were collected about sociodemographic and sociocultural factors including age and education, relationship status, income insufficiency experienced in the last six months, residential stability measured as homelessness experienced in the last twelve months, education, current student status, self-reported HIV status, and gender identity; the multivariate regression model controlled for these factors . Additional covariates used as controls in the analysis included the estimated size of the MSM network which was defined by the number of other men who have sex with men respondents knew and with whom they regularly communicate, and second, the number of person's named in their emotional support network (of up to five individuals) to whom it had been disclosed that they have

sex with men; both factors were thought to potentially moderate feelings of closeness to Black and gay communities.

Statistical Analysis

Descriptive analyses were conducted and are presented in Table 5-1 and Table 5-2. Predictors and covariates were identified and collapsed to be analyzed as dummy variables (as previously described in the Methods). Bivariate logistic regressions were conducted to determine statistically significant relationships with the dependent variable before adjusting in a multivariate logistic regression model. Additionally, analysis of potential interactions between variables was also explored. The Generalized Estimating Equation approach was used to provide robust standards of error to account for correlated observations among respondents who were referred into the study by peers in their network [69-70]. Missing data accounted for less than 10% among all relevant variables and were treated as missing at random. All statistical analyses were conducted using Stata 15. A two-tailed p-value of less than 0.05 was considered statistically significant and p-values greater than 0.05 and less than 0.10 were considered marginally statistically significant.

RESULTS

Tables 5-1 and 5-2 show characteristics of the sample by social identity category and closeness with that community of social identity. The mean age was approximately 23 years,, and the majority (63.7%) of respondents were between the ages of 19-24. Forty-

eight respondents reported transgender identity. With approximately 80% of the sample reporting a yearly income of $20,000 or less, 43.3% of the sample experienced income insufficiency over the last six months. Current student status was reported by 32% of the sample; nearly 16% of the sample had achieved their associates degree or higher and under 35% had less than a high school education. Homelessness over the last year was reported by 25.3% of YBMSM in the sample, and prevalence of self-reported HIV seropositivity was 24.3%. When measuring core discussion/emotional support networks, respondents on average listed two names but reported larger networks that included other MSM they know and regularly communicate with, a mean of 13.3 MSM (SD=20.8).

Responses to community closeness were derived from two Likert-type scale items shown in Table 5-1 and Table 5-2. A descriptive summary of their responses follows. Strong feelings of closeness with the Black community were expressed by 86.3% of YBMSM who reported feeling very or somewhat close to the Black community. On the other hand, only 66% of the sample felt very or somewhat close to the gay community. A paired t-test comparing the mean responses to these items showed that YBMSM reported higher feelings of closeness to the Black community (M=1.72, SD=0.80) compared with closeness to the gay community (M=2.24, SD=0.94); $t(614)=-12.17$, p=.00.

Greater closeness with the Black community was slightly favored among the youngest ages of 16-18 with 90% reporting very to somewhat close vs 85.5% for 19-24 year old group

and 87.3% among ages 25-29, while the absence of feeling close to the gay community (not close at all and not very close) was more prevalent among 25-29 year old respondents (65.3% vs 35% for 19-24 age group and 23.5% among YBMSM ages 16-18). Transgender identified individuals reported more closeness to the gay community (81.3%) compared to male identified respondents (64.6) although closeness to the Black community was slightly favored among male identified respondents (86.5% vs 80.8% among transgender identified respondents). Closeness to the Black community did not differ much based on perceived income sufficiency (86.5% vs 85.9% for closeness to the Black community; 64.0% vs 67% for closeness to the gay community), but unstably housed YBMSM seemed to report slightly greater closeness with the gay community (72.2%) compared with those stably housed over the last year (64%). The proportion of YBMSM reporting closeness to the Black community was roughly similar by self-reported HIV status, yet a higher proportion of HIV negative YBMSM reported no close feelings at all to the gay community (15.1%) compared with seropositive YBMSM (5.3%). YBMSM reported the number of alters in their emotional support network who were aware that they had sexual relationships with other men. The mean number of alters to whom that was disclosed was 2.4 (1.3) network members. YBMSM who reported less closeness to the Black community reported more disclosures in their network above the mean of 2.4 ('not close at all' M=2.8 (1.2) and 'not very close' M=2.6 (1.2)); whereas for closeness to the gay community, the number of MSM disclosures were the same as the mean number of disclosures (M=2.4) except fewer disclosures of MSM sexual behavior was observed among those who felt no closeness at

all to the gay community, M=2.2 (1.3). Also, YBMSM with stronger closeness to the gay community reported a higher mean of MSM in their network, M=20.4 (28.8) for YBMSM with very close feelings, compared to the mean size of the MSM network among those with the strongest feelings of closeness to the Black community, M=13.5 (22.1).

A greater proportion of respondents indicated stronger feelings of closeness with the Black community. To allow for greater variance in the responses of attachment to the Black community, we collapsed the variable to include those who expressed the strongest feelings of attachment to the Black community (very close) compared with those who expressed a less close attachment (somewhat close, not very close, not at all). With this recoded variable, the strongest feelings of closeness to the Black community was reported by 53.7% of YBMSM, and those with less close or no feelings of closeness was reported by 46.3% of the sample. [This recoded dummy variable was selected for use in the bivariate and multivariate regression analyses.]

With attention to the overlapping social identity group membership, we created a composite variable of several combinations of group affiliations between the two communities; we found that 91.7% of YBMSM who reported closeness to the gay community (very close and somewhat close) also reported close attachment to the Black community (very close and somewhat close) whereas only 70.2% of YBMSM who felt close to the Black community (very close or somewhat close) also reported closeness to

the gay community. Analyzing these combinations using the recoded Black community closeness variable (described in the paragraph above), 75.1% YBMSM expressed feelings of closeness to both the Black and gay communities while 41.5% reported less closeness or none at all with either the Black or gay communities. Nearly 25% of respondents felt the strongest attachment to the Black community, but not the gay community whereas 58.5% strongly felt close to the gay community but less close to the Black community, if at all.

In the bivariate and multivariate models shown in Table 5-3, we examined the extent to which closeness to the Black and gay communities were associated with problematic loneliness. Bivariate analysis of closeness to the gay community showed reduced odds of problematic loneliness (unadjusted OR=0.64, p=0.02) as similarly did closeness to the Black community (unadjusted OR=0.54, p=0.00). Results did not show an interaction between closeness variables and MSM disclosure, sexual orientation, or size of the MSM network.

Table 5-3 shows the adjusted model, 1a in which feelings of closeness with each community were analyzed independently; collective social identity group attachment was associated with reduced odds of problematic loneliness by half (closeness to the Black community AOR=0.54, CI=0.40, 0.72; closeness to the gay community AOR=0.64, CI=0.44, 0.92), adjusting for the size of their MSM network and extent of disclosure within

their emotional support network. Controlling for MSM disclosure slightly reduced the magnitude of the odds ratio for closeness to the Black community (AOR=0.63, CI=0.43, 0.92) but increased the magnitude of the effect on loneliness for closeness to the gay community (AOR=0.52, CI=0.34, 0.79). Additionally, we found that reporting transgender identity was associated with a statistically significant 1.7 times greater odds of problematic loneliness (AOR=1.73, CI=1.01, 2.95) after adjusting for factors in the base model. Interestingly, results from a post-hoc bivariate regression analysis showed that gender identity did not predict community closeness with either the Black community or the gay community, but achieved statistical significance when included in the fully adjusted model. Nonetheless, gender identity did not affect the magnitude of the association between problematic loneliness and attachment to social identity groups. Unexpectedly, we also found that in the adjusted model for each alter in the emotional support network to whom MSM behavior was disclosed, there was a 20% greater odds ratio of problematic loneliness.

In model 1b, we explored a composite of close attachments to both communities; indicating, as a combined social identity group feelings of closeness with Black and gay communities was independently protective against problematic loneliness reflecting a 68% reduced odds ratio compared to YBMSM reporting no close attachments to the Black and gay social identity communities (AOR=0.32, CI=0.19, 0.53). Again, in this adjusted model transgender identity was associated with roughly 70% greater odds ratio of problematic

loneliness though those factors did not express any association. No other combinations of affiliation were found to be statistically significant.

DISCUSSION

The closeness measure used in this study has been used as an indicator of group identification that captures the core conceptual experience of group identification secured through feelings of closeness [33]. Consistent with prior literature, we found that feelings of closeness to the Black community were higher for YBMSM than feelings of closeness to the gay community, an observation that echoes the tensions described in the literature[99]. Non-heteronormative sexual identities have historically been largely depicted as incompatible with values in the Black community [56]. In the view of some Black LGBT persons, they find more support and sanctuary within Black communities as active resistance against racism perpetuated in the "White" gay community [56-58].

Results showed support for the proposed hypotheses: close feelings to Black and gay social identity groups were associated with reduced odds of problematic loneliness, and close feelings to both social identity groups compared to no close attachments to either group were also protective against problematic loneliness. These associations were found to be independent of the number of MSM known and also independent of the number of individuals in their emotional support network with knowledge of their sexual relationships

with other men; that is to say these protective benefits may not be dependent on their level of outness to their emotional support network or volume of associations with other MSM.

Reporting transgender sexual identity was associated with increased odds of problematic loneliness in the adjusted regression models. Additional analyses revealed that transgender identity became a factor of statistical significance only when closeness to the gay community was added to the model of predictors though gender identity was not associated with closeness to Black or gay communities in the bivariate regression models. This finding warrants additional investigation;; however, while the experiences of transgender participants are important, their unique experiences with loneliness were not the focus of this particular analysis.

Social Resources in Social Identity Networks

Regarding the effect of group identity on loneliness among the full sample, main effects could possibly arise through access to resources embedded in community networks of similar others such as social resources, psychological resources, opportunities for social engagement, exposure to health promoting values, and cultural capital which act to buffer against loneliness. Studies that examine available resources through those social categories of identity would help to concretely identify those resources. It is also possible that closeness to social identity communities potentially facilitates increased social engagement and community participation, which itself has implications for less loneliness. Including a

measurement of intra-group interaction, roles, and behaviors attributed to group social identity and the degree of embeddedness in the network pertaining to those identities would provide deeper insight as to the mechanisms that relieve the distress of loneliness which link YBMSM to improved health.

Meaning-Making Through Social Identity & Loneliness

The main effects of the study find corroboration with the identity accumulation hypothesis which suggests that social identities provide meaning and guidance in people's lives by carving a place for them within society, thereby facilitating social integration. A readily identifiable example of the capability of meaning-making communities has been observed through close connection to religious or spiritual group identity and its impact on the health of those who closely identify [60-61].

We also speculate that group social identity predisposes YBMSM to the benefit of shared meaning-making in the development of their concept of self. Drawing from Charles Cooley's theory of the "looking glass self," individuals build a concept of self that is based on the way they imagine others feel about them and the judgements made about them based on that perception [62]. In the case of loneliness, individuals are negatively aroused by perceptual distortions that anticipate alienation and rejection from individuals in their social community [63]. It may be that participation in the co-construction of self-concept and role identity through shared social identities eases the fear of isolation and supports

meeting social connection and belongingness needs. Through possession of their social identity, individuals may feel less vulnerable to environmental and existential threats to the self.

Multiple Social Identities & Loneliness

Findings from the current study showed that reporting closeness to Black and gay communities combined was advantageous for YBMSM with respect to loneliness. Though research has suggested that for some Black gay men Black identity may take precedence over gay identity, our results suggest that greater closeness to both is instrumental in mitigating loneliness, and has a stronger effect combined rather than analyzed separately. This could be the result of multiple group membership or the benefit of multiple identities which the literature suggests boosts psychological health [43,64].

Implications of Social Identity Interventions on Sexual Health Outcomes for YBMSM

Connecting health outcomes and collective social identity with Black and gay communities grounded in the work of Hotton et al. [20], points to both benefits and costs to health that are associated with close attachment to Black and gay communities. A different study using this same cohort of YBMSM found that feelings of closeness with "the gay community" were associated with greater knowledge of PrEP and increased likelihood of participation in a behavioral prevention program; conversely, group closeness was associated with sexual health risks such as greater odds of transactional sex, sex under the

influence of drugs and alcohol, and increased odds of self-reported HIV seropositivity [20]. Higher levels of closeness to "the Black community," on the other hand, were found only to be associated with reduced odds of self-reported HIV seropositivity [20]. These associations seem to confirm that ties of closeness with groups representing categorized social identities have implications for health outcomes for YBMSM inclusive of the protective benefit against distressing loneliness found in this study.

Social identity intervention efforts may be used as a strategy to ameliorate some of the aforementioned negative health outcomes while optimizing the benefits to social connectedness that arise through enhanced social identity group ties. However, there are potential risks to this strategy. Furthermore, to inform intervention development for YBMSM, research is needed to explore how closeness to these social identity communities is cultivated and maintained in the life experience of YBMSM; qualitative or ethnographic methodologies might be well-suited to accomplish this aim. Additionally, future research is needed to discern if protection against loneliness is dependent upon category specificity, the saliency of the identity, and whether its effect varies over the life course for younger vs older BMSM.

Ultimately, greater clarity could be achieved if we could explore how collective social identity helps to define the self-concept of YBMSM, promotes belongingness and social integration to reduce the distress of social disconnection. It is hoped that intervention

development for YBMSM would continue on a path toward greater inclusion of group social identity approaches to improve the social and emotional well-being of YBMSM, and determine its utility to support greater engagement by BMSM in HIV prevention and the HIV care cascade, especially as peer level support and peer-related interventions that have been instrumental in supporting HIV positive individuals.

Study Limitations

There are limitations to the study that warrant mention. Given the cross-sectional study design, we cannot infer directionality of the relationship between closeness to social groups and loneliness; that is to say, embodied loneliness itself may potentiate less close attachments. Regarding the measurement of loneliness, the single-item measure was extracted from the Brief Symptoms Inventory [54] which is used to measure the clinical significance of psychological distress symptoms. While the use of single-item measures in loneliness research has been pervasive [65-66], it may underestimate loneliness in the population [67]. Several studies of loneliness have called for the use of measures that would allow for comparison across studies and populations while supporting assessment of scale validity and reliability. The single-item measure used in this study, nonetheless, shows face validity which contributes to meaningful interpretation of findings regarding the impact of feelings of loneliness, irrespective of how individual meanings of loneliness may vary. The measure of closeness is also challenged as respondents may have different interpretations of the Black community and the gay community. As we have asserted,

these communities are by no means monolithic as many intersecting identities exist within each broader community.

Last, the results may not be generalizable beyond the urban Chicago regional context and the United States. On the one hand, Chicago has been increasingly accommodating to LGBT culture and specifically has regions of the city that serve as enclaves for racial sexual minorities [48]. So, the context of group identification may be influenced by a broader cultural acceptance of homosexuality in the North and South Sides of Chicago compared to other cities and states. Similarly, Chicago has also been home to powerful movements in the Civil Rights Movement [48] which may also contextualize strong affinity and group identification with Black communities. From a national perspective, cultural or nationalist identities that are less tolerant of non-heteronormative gender and sexual identities may be incompatible with or outweigh the protective benefits accrued to social connectedness observed in the sample. Studies invoking cross-cultural comparisons would allow a fuller exploration of the capacity of the social identity framework and health for sexual minority groups in cross-national settings.

CONCLUSION

As strategies and interventions for improved health of YBMSM are developed, they should include opportunities for the mobilization of Black and gay social identity communities to bolster social connectedness. There is a rich historical legacy, national and global in scope,

of early AIDS activism which mobilized social identities to amass political power which have resulted in critical advancements in prevention and treatment of HIV, and even more broadly, social transformation and social justice for racial and sexual minorities [68]. Based on the recommendation of Deaux and Martin [36], public health interventionist, advocates, and policy makers are encouraged to take a deeper look at opportunities to support the mobilization of community efforts which potentially are natural vehicles for enhanced social identity. Study findings suggest an appreciation of YBMSM's close attachment to Black and gay social identity communities as a means of promoting improved psychological health and well-being. They also suggests the benefit of a society that makes space for the inclusion of diverse racial and sexual identities and facilitates access to those identities as paths to improved social well-being.

TABLES AND FIGURES

Table 5-1. Descriptive characteristics of YBMSM ages 16-29 by 'Closeness to the Black Community'.

	Total	Closeness to the Black Community			
	N (%) / mean (SD)	Not close at all	Not very close	Somewhat close	Very Close
Age	22.8 (3.1)				
16-18	51 (8.3)	5.9%	3.9%	49.0%	41.2%
19-24	392 (63.7)	3.6%	11.0%	39.3%	46.2%
25-29	172 (28.0)	5.2%	7.6%	39.0%	48.3%
Transgender					
Yes	48 (7.8)	10.6%	8.5%	34.0%	46.8%
No	568 (92.2)	3.7%	9.5%	40.3%	46.5%
Relationship Status					
Single	372 (60.3)	2.7%	8.7%	41.1%	47.6%
Partner	245 (39.7)	6.5%	10.6%	38.4%	44.5%
Income Insufficiency (Last 6 months)					
Yes	263 (43.3)	3.8%	10.3%	41.8%	44.1%
No	344 (56.7)	4.7%	9.0%	38.4%	48.0%
Education					
H.S. Diploma or less	518 (84.4)	4.1%	10.4%	39.2%	46.3%
Associates Degree or higher	96 (15.6)	5.2%	3.1%	44.8%	46.9%
Student Status					
Yes	196 (32.0)	5.1%	11.7%	39.8%	43.4%
No	419 (68.1)	3.8%	8.4%	40.1%	47.7%
Homeless (Last 12 months)					
Yes	155 (25.3)	3.2%	9.0%	41.3%	46.4%
No	458 (74.7)	4.6%	9.6%	39.7%	46.1%
Self-report HIV+					
Yes	149 (24.3)	6.0%	9.4%	40.3%	44.3%
No	463 (75.7)	3.7%	9.5%	39.7%	47.1%
MSM Disclosure # of alters in Core Discussion Network	Mean=2.4 (1.3)	Mean=2.8 (1.2)	Mean=2.6 (1.2)	Mean=2.5 (1.3)	Mean=2.3 (1.3)
Size of MSM Network	Mean=13.3 (20.8)	Mean=9.5 (12.1)	Mean=14.8 (22.8)	Mean=12.9 (19.6)	Mean=13.5 (22.1)
Closeness to the gay community					
Not close at all	78 (12.7)	11.5%	10.3%	41.0%	37.2%
Not very close	130 (21.1)	6.2%	19.2%	42.3%	32.3%
Somewhat close	268 (43.6)	2.6%	7.1%	46.6%	43.7%
Very close	139 (22.6)	1.4%	4.3%	24.5%	69.8%

Table 5-2. Descriptive characteristics of YBMSM ages 16-29 by 'Closeness to the Gay Community'.

	Total	Closeness to the Gay Community			
	N (%) / mean (SD)	Not close at all	Not very close	Somewhat close	Very Close
Age	22.8 (3.1)				
16-18	51 (8.2)	13.7%	9.8%	62.8%	13.7%
19-24	394 (63.8)	11.4%	23.6%	41.6%	23.4%
25-29	173 (28.0)	23.1%	42.2%	19.7%	15.0%
Transgender					
Yes	48 (7.8)	2.1%	16.7%	41.7%	39.6%
No	568 (92.2)	13.6%	21.8%	43.5%	21.1%
Relationship Status					
Single	372 (60.3)	12.9%	18.8%	44.9%	23.4%
Partner	245 (39.7)	12.2%	24.9%	41.6%	21.2%
Income Insufficiency (Last 6 months)					
Yes	264 (43.3)	14.4%	21.6%	45.1%	18.8%
No	346 (56.7)	11.6%	21.4%	41.9%	25.1%
Education					
H.S. Diploma or less	520 (84.3)	12.7%	21.0%	43.5%	22.9%
Associates Degree or higher	97 (15.7)	12.4%	23.7%	43.3%	20.6%
Student Status					
Yes	198 (32.0)	12.1%	24.2%	44.4%	24.1%
No	419 (68.0)	12.9%	20.0%	43.1%	19.2%
Homeless (Last 12 months)					
Yes	155 (25.2)	14.8%	12.9%	47.7%	24.5%
No	461 (74.8)	11.9%	24.1%	42.3%	21.7%
Self-report HIV+					
Yes	150 (24.4)	5.33%	24.7%	50.0%	20.0%
No	465 (75.6)	15.1%	20.2%	41.3%	23.4%
MSM Disclosure to Core Discuss./ Emotional Support Network	Mean=2.4 (1.3)	Mean=2.2 (1.4)	Mean=2.4 (1.3)	Mean=2.4 (1.3)	Mean=2.4 (1.2)
Size of MSM Network	Mean=13.3 (20.8)	Mean=12.8 (23.8)	Mean=11.1 (16.9)	Mean=10.7 (15.4)	Mean=20.4 (28.8)
Closeness to the Black community					
Not close at all	26 (4.2)	34.6%	30.8%	41.1%	7.7%
Not very close	58 (9.4)	13.8%	43.1%	50.8%	10.3%
Somewhat close	246 (40.0)	13.0%	22.4%	32.8%	13.8%
Very close	285 (46.3)	10.2%	14.7%	26.9%	34.0%

Table 5-3. Logistic models of problematic loneliness among YBMSM by 'closeness' to Black & gay communities

Factor	Bivariate Associations with Problematic Loneliness	Model 1a: Closeness with Black or Gay Community (Separately) n=592	Model 1b: Closeness with Black & Gay Community (Combined) n=595
	Unadjusted odds ratio (95% C.I.)	Adjusted odds ratio (95% C.I.)	Adjusted odds ratio (95% C.I.)
Age	1.04 (0.97, 1.12)	0.99 (0.91, 1.08)	0.99 (0.91, 1.08)
Partnered Relationship	**0.50 (0.34, 0.74)****	**0.41 (0.25, 0.67)****	**0.41 (0.25, 0.66)****
Transgender Identity	**1.69 (1.00, 2.83)***	**1.73 (1.01, 2.95)***	**1.71 (1.00, 2.93)***
Income Insufficiency	**2.18 (1.53, 3.11)****	**2.00 (1.33, 3.00)****	**1.99 (1.34, 2.94)****
Homelessness	**2.34 (1.52, 3.60)****	**2.51 (1.51, 4.17)****	**2.50 (1.50, 4.17)****
College Degree	1.45 (0.88, 2.40)	1.79 (0.96, 3.31)$^{+}$	1.77 (0.95, 3.30)$^{+}$
Current Student	0.82 (0.54, 1.23)	1.12 (0.80, 1.57)	1.10 (0.78, 1.55)
Self-report HIV+	**2.15 (1.38, 3.35)****	**2.12 (1.26, 3.56)***	**2.11 (1.25, 3.55)***
MSM Disclosure to Core Discussion/ Emotional Support Network	**1.21 (1.09, 1.34)****	**1.20 (1.03, 1.39)***	**1.20 (1.03, 1.39)***
MSM Network Size			
0-10	**1.12 (1.04, 1.20)***	**1.11 (1.02, 1.20)***	**1.11 (1.02, 1.20)***
10+	**0.89 (0.83, 0.96)***	**0.90 (0.82, 0.98)***	**0.90 (0.83, 0.98)***
Closeness to:			
Black community	**0.54 (0.40, 0.72)****	**0.63 (0.43, 0.92)****	-
Gay community	**0.64 (0.44, 0.92)***	**0.52 (0.34, 0.79)****	-
Neither communities	Reference	-	Reference
Both communities	**0.41 (0.25, 0.66)****	-	**0.32 (0.20, 0.53)****
Black and not gay	0.68 (0.38, 1.20)	-	0.77 (0.46, 1.27)
Gay and not Black	0.79 (0.45, 1.39)	-	0.57 (0.36, 3.17)$^{+}$

**p-value ≤ 0.001; * p-value ≤ 0.05; $^{+}$p-value ≤ 0.10

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CHAPTER SIX

Conclusion

The following sections of this chapter provide a brief recount of key findings from each of the studies contained within the dissertation and include observations related to programmatic/policy implications as well as note future directions for research.

Study 1: Synopsis of Findings

Chapter 3 established the prevalence of loneliness and social correlates of loneliness among YBMSM in the uConnect cohort. The project demonstrated the benefits of a more sociological analysis of loneliness as influenced by one's social context, which this project accomplished through an examination of the relationship between loneliness and a cascade of socio-structural factors—some of which have been identified as 'loneliness provoking factors' in previous studies and are associated with domains of social stability. The prevalence of loneliness was 19% which is within the range reported by some studies of a 15-30% prevalence in the general population [1-4] and a 20% prevalence among a sample of primary care patients [5]. An adjusted multivariate logistic regression model showed that income inadequacy over the past six months, residential instability over the last 12 months, lifetime criminal justice involvement, and HIV seropositivity were associated with increased odds of distressing feelings of loneliness. Also, results suggested that having a romantic partner offered a protective benefit as it was associated with reduced odds of loneliness. However, the finding that an associates or higher educational degree was associated with greater odds of problematic loneliness was a unique finding; in offering an explanation for this finding, the literature suggests that educational attainment for Black

males does not necessarily confer the same advantage of protection against poor mental health outcomes as it does for Whites and Black women with similar education [6]. Alternatively, it was reasoned that the upward mobility that comes with higher educational attainment could possibly alienate YBMSM from opportunities for meaningful social connections resulting in perceived social isolation [7]. The findings offer support for the hypothesis that loneliness is not entirely a deficit arising from personal failures in social competency but may also be highly influenced by socio-structural realities of disadvantage that YBMSM encounter; noteworthy, this type of analysis does not permit causal direction to be assessed.

Study 1: Programmatic/Policy Recommendations

Public health and clinical interventions could integrate opportunities within its components to provide enriching social experiences for YBMSM experiencing social disadvantage in order to potentially mitigate its deleterious impact on YBMSM's capacity to experience fulfilling social connections. Programs, service organizations, and care providers could include an assessment of loneliness or utilize other indicators of the social well-being of YBMSM as it may have implications for the uptake and efficacy of interventional services. Greater attention regarding assessment and intervening on loneliness could be focus on HIV-positive YBMSM given the complex of social disadvantage that confronts them and impedes their social connection and cohesion; there are potential implications relative to HIV transmission and prevention behaviors and the medical management of their diagnosis

leading to viral suppression. Moreover, given that one pathway for loneliness to disrupt health is through chronic stress activation and the impact of stress on the body might have implications for immune functioning and the course of HIV disease progression.

With an increasing emphasis on social determinants of health in public health discourse, medical management and health services research—all being martialed to successfully move HIV-positive YBMSM through the cascade of care, structural interventions related to improving their social stability (i.e., social determinants of health) are important aspects that need to be addressed. There is current discourse about access to care but a need for a greater emphasis on access to and the impact made by the social relationships that support lifelong engagement in care.

In light of the benefit of romantic partnerships which was associated with reduced odds of loneliness, public health interventions might consider developing interventions that build the capacity of YBMSM to strengthen healthy intimate partnerships. Alternatively, it might also be beneficial to include and draw upon the strength of romantic partnerships within intervention and service strategies to achieve improved health outcomes, provided those health outcomes are associated with loneliness. At the policy level, advocating for and maintaining social policies that secure public safety nets which favor stronger social stability for YBMSM is an important approach to address the distress of loneliness and its concomitant impact on mental and physical health.

Study 1: Future Research

As it pertains to further exploration of the social epidemiology of loneliness among BMSM, a longitudinal analysis could contribute to further characterization and definition of their experience of loneliness, specifically its temporality and patterns of transition between states of less intense and more intense loneliness.

Future studies should take advantage of using validated measures of loneliness to compare with the findings of this study and could extend the analysis to include neighborhood level factors and other socio-cultural/structural factors. Future research should include older HIV-positive BMSM as it has been estimated by the CDC that 47% of Americans living with diagnosed HIV were aged 50 and older [8]. For younger and older HIV-positive BMSM who report distressing loneliness, an analysis of HIV health outcomes associated with loneliness and relevant socio-structural factors may yield important insights for the development of intervention components to address perceived social isolation, medication adherence, maintenance of viral suppression, and engagement in medical management.

There are also significant questions research can answer regarding the extent to which intervening on sociostrucural factors, particularly those related to domains of social stability, mitigates distressing feelings of loneliness, and the extent to which an intervention on loneliness improves health outcomes for YBMSM. Lastly, it is important

to assess whether there are racial disparities in the experience of loneliness and if those disparities are associated with perceptions of social isolation.

Study 2: Synopsis of Findings

Given that loneliness manifests through the subjective evaluation of one's network [9], in this study we examined the association between loneliness and structural aspects of YBMSM's networks, specifically the size of their MSM, BMSM, and sexual partnership networks, and the size and density of their emotional support/core discussion network. Though previous research has suggested that large or growing social networks protect against loneliness [22], the adjusted analysis in the current study showed that for each additional member of YBMSM networks, the odds of distressing loneliness increased, albeit an effect observed only up to 10 MSM identified in the MSM network. These results suggest that more people in YBMSM's network, indicative of less objective social isolation, may not be a sufficient condition to protect against problematic loneliness; in fact, the experience of loneliness among YBMSM with larger networks might go unattended because of the presumption that greater availability of social contacts suggests less loneliness. Despite findings in the literature that loneliness is associated with smaller network size, our results confirm those of Child and Lawton [9] whose study found that young adults reported twice as many days lonely compared to middle-age adults despite having larger networks.

Conversely, we found evidence that greater density of YBMSM's core discussion network was marginally associated with reduced odds for distressing loneliness, possibly indicating greater embeddedness of YBMSM in their emotional support network. Additionally, results showed that each additional network member of YBMSMs' sexual partnership networks was associated with increased odds of loneliness; however, after adjusting for the size of the MSM network, it was found that beyond 10 individuals in the MSM network, the main effect of the number of sexual partners on loneliness was suppressed. This finding suggests that perceived social isolation is a relevant factor underlying the sexual risk behavior of multiple sexual partners mostly among YBMSM who are more objectively socially isolated from other MSM.

Study 2: Programmatic Recommendations

Interventions designed to reduce social disconnection and address feelings of social isolation among YBMSM whose strategy is to increase the size of their social networks may be insufficient, and potentially exacerbate the distressing experience of loneliness. Rather interventions should focus on opportunities for meaningful social engagement and mutual exchange through activities and strategies that help YBMSM make and sustain those connections. Program features should assist YBMSM to increase embeddedness in their networks—creating micro-communities wherein members of their support networks are connected with each other. Such an intervention might help YBMSM establish peer networks for health, well-being, and success.

YBMSM with the sexual risk behavior of multiple sexual partners might benefit from loneliness assessment and intervention especially if they report knowing fewer MSM in their social networks; they could possibly benefit from interventions, either through individual counseling or group delivery format, that focus on identifying and managing feelings of loneliness, and increase their awareness of how vulnerability to their social well-being (i.e., feeling lonely) could lead to sexual risk behavior. Addressing loneliness may come in the form of participating in groups or interventions that help them feel connected. Additionally, the use of mindfulness techniques delivered via smartphone application over fourteen days has been shown to reduce daily loneliness in a randomized control trial [23]. The intervention delivered via smartphone promoted monitoring of present-moment emotions and provided acceptance training without the influence of social factors provided in group delivery format; comparing measurements of daily loneliness three days before the intervention and three days after, there was a 22% decrease in daily life loneliness [23]. Ultimately, social service and public health interventions should consider prioritizing programs with components that promote community building, relationship building, and healthy self-evaluation *in addition* to biomedical tools such as PrEP to secure optimal sexual health.

Study 2: Future Research

Future studies could focus on disaggregating the size of YBMSM's network in terms of composition (the percent male in emotional support networks or the percent of kin) and the quality of ties (i.e., measures of frequency of communication and subjective sense of closeness). It would also be important to consider the structure and functional factors of social media networks to examine their association with loneliness and sexual risk behavior.

As it pertains to the unexpected result of greater odds of loneliness for each additional member of the emotional support network, a qualitative investigation might further explain why more social support would be associated with more distressing feelings of social isolation. A qualitative investigation could explore the impact of social support on perceptions of social isolation and whether the provision of emotional and instrumental support is sufficient to address desired levels of intimacy. Athough social support may be mobilized when YBMSM are in crisis, the exchange lacks the capacity to fulfill belongingness needs. Using other validated measures of emotional and instrumental support would also be recommended to determine if the finding of a positive relationship between loneliness and emotional social support is replicated.

Qualitative investigations could also be helpful in identifying and characterizing aspects of high-density support networks that have the potential to reduce loneliness, and furthermore

investigate mechanisms by which high-density networks facilitate improved health outcomes.

Regarding sexual partnership networks, an analysis of sexual risk behaviors linked to multiple sexual partners (i.e., awareness of HIV status or condomless sex) would further clarify the nature of the sexual risk accompanying feelings of loneliness for YBMSM as guided by the framework of the Loneliness Sexual Risk Model [10]. Additionally, future research might include an analysis of the use of sexual hook-up apps for casual sexual encounters and whether loneliness belies those sexual partnerships.

Study 3: Synopsis of Findings

This study examined the extent to which attachment to group social identity, also known as collective social identity, is associated with loneliness for YBMSM, particularly given that close attachment is to largely marginalized and stigmatized social identity groups. Findings revealed that feelings of closeness to the Black community were higher for YBMSM than feelings of closeness to the gay community, an observation that echoes tensions described in the literature. Results further suggest a protective benefit against loneliness results from close attachment to Black or gay social identity groups; collective social identity attachments may, in fact, promote resilience among YBMSM. Group social process theories posit that collective social identity exerts its effect on loneliness by providing meaning and helping individuals experience a sense of belonging [11]. Findings

also showed YBMSM reporting closeness to both Black and gay communities was more advantageous with respect to loneliness compared to a lack of attachment to neither. The literature supports this finding by explaining that multiple identities potentially increase access to more support when a person is in need [12], and that those who have attachments to multiple valued identities may be more socially integrated [11].

It is important to note that a more appropriate interpretation of these findings may be that social identities matter rather than offering an evaluative assessment that attachment to social identity groups is good [13]. Nonetheless, as it pertains to medical settings and the development of public health interventions, especially peer interventions, these findings provide evidence that rather than suppression, the expression of and capitalization on valued identities may result in better psychological health outcomes [13]. The literature suggests that a collective or social identity approach helps individuals develop a self-concept that ultimately influences the way one thinks, feels, and acts—all vital elements to enable health [13]; the implication is then that reduced odds of loneliness associated with group social identity attachment may increase YBMSMs' capacity for resilience by supplying an enhanced social well-being when facing vulnerability to negative health risks.

Study 3: Programmatic/Policy Recommendations

In the literature, a lack of social process theory underpinning interventions for social isolation has been noted [14]; conceptualizations of interventions rooted in the social

identity approach are still fairly nascent as the development of related theories had not originally focused on theory application [13]. Thus, those insights have yet to be fully developed into health interventions whose impacts have been researched [13].

There is evidence of the effectiveness of the social identity approach within the group context in promoting physical activity [15]; perhaps HIV prevention could engage collective social identity-based support groups that offer support to YBMSM in their health journeys. A collective social identity approach might also serve as a vehicle for augmenting community mobilization efforts; by centering social identity related activities that increase social connection and thereby reduce loneliness, it could encourage social participation and social involvement which may eventuate better health outcomes.

In the absence of many examples of social identity interventions that might address loneliness and facilitate better health outcomes, one example based on the social identity approach is provided. Groups for Health (G4H) was designed to address the lack of interventions anchored in the science of social processes [14]. Participants in the Groups 4 Health (G4H) intervention reported improved mental health, well-being, and social connectedness that was sustained for six months after the intervention [14, 16]. The intervention included a five-module program delivered in a group format which facilitated social connectedness among college students who self-reported social isolation and co-occurring depression or anxiety [14]. One of the modules focused on an activity called

social identity mapping (SIM), a procedure that uses an interactive format to guide participants in the exploration of their valued social identities and the range of group-based resources that might be available for optimal health in those social identity groups [16]. The SIM procedure involves: (1) facilitated group specification and their importance to the participant (2) group ratings of the degree of group positivity, degree of social contact, group tenure, the degree of alignment between the meaningfulness of group membership and their perception of themselves; (3) delineation of group similarities; (4) and lastly a visualization of group compatibility [16].

Study 3: Future Research

A particular challenge for this study was the need for a more explicit assessment of YBMSM's attachment and identity as members of that group; there are other evaluative factors that reflect the extent of collective social identity attachment useful for measurement [see 17 for an extensive discussion on an organizing framework for measuring collective identity attachments]. Future research also should pay attention to the intersectionality of multiple group memberships as well as create measurements that are inclusive of the multiple communities nested within Black and gay communities; qualitative investigations may be well-suited to explore those considerations.

There is a need for future research to utilize measures that assess actual interaction of individuals within an ingroup network along with collective social identity attachment [18].

Future studies might consider including measurement of intra-group interaction, roles, and behaviors. This may provide deeper insight into mechanisms and resources involved in social identity attachment that reduce distress of loneliness and potentially link YBMSM to improved health outcomes.

Overall Synthesis of Project

Marginalization, stigma, racism, and homophobia are unfortunate realities for Black men who identify and/or express their sexuality in non-heteronormative ways. As a consequence imputed to them for their transgressive identities and behavior, they greatly risk disenfranchisement, diminution of their social status and belongingness needs; what may be a unique source for YBMSM contributing to the distress of their loneliness may be akin to the complexity defined by W. E. B. Dubois as the 'double consciousness' that Black individuals experience. For too many YBMSM these experiences happen early in life disrupting healthy identity development and creating vulnerability for several negative outcomes amidst the onslaught of other complex life challenges unique to their experience as BMSM. The findings from this dissertation seek to reposition the public health gaze from the biomedicalization of their challenges to a more fundamental assessment of the extent to which basic belongingness needs and barriers to social well-being may underlie the health issues that affect them.

Findings support the notion that our social environment and structural aspects of the social world can create significant barriers to social connection. Public health researchers and practitioners should be deliberate about integrating an emphasis on the social well-being of YBMSM when identifying and assessing health challenges and in the development of health interventions that enable greater agency to achieve better health outcomes.

Insight gained from findings in the current project have implications for research priorities in the study of loneliness as a social determinant of health for YBMSM. First, it is recommended that public health research prioritize and broadly conceptualize the multiple research opportunities with YBMSM and other MSM populations to include both a direct and indirect (validated scale) measurement of loneliness for the purposes of continuing to establish and support prevalence estimates, identifying socio-structural correlates/social determinants of health and related disparities, and contributing to identification of potential disparities through comparisons with existing and new studies inclusive of comparisons between MSM racial/ethnic groups, heterosexual populations and other intersectional identity communities. A mixed methods approach might be most appropriate for inclusion of a qualitative study design to further define loneliness among YBMSM and to determine whether existing measures adequately reflect their experiences. Second, research needs to further parameterize loneliness using measures of trait and state based loneliness which could be studied using an ecological momentary assessment methodology as well as longitudinal study designs to study transitions of loneliness over time, and social network

methodologies to extend the characterization of both functional and structural aspects of network structures of lonely vs less lonely BMSM. The third important research direction might is analyses of health outcomes with loneliness. It may be useful to explore mortality rates and disparities by assessing social connection and social relationship variables to help to discern how social integration and social connection variables might be differentially associated with health disparities among BMSM. As has been mentioned, care should be taken to not only look at sexual risk behavior among BMSM when analyzing morbidity and mortality among BMSM albeit, but also assess HIV/STI outcomes.

In public health practice, structural interventions are necessary to address socio-structural factors and social determinants of health that alter paths to social connectedness and affect the health of YBMSM. Policies that provide financial support for resources in marginalized communities to enhance their sense of social well-being should be prioritized. Policy analysis tool such as Health in All Policies and the development of other policies should include an analysis of their impact on the capacity and implications for YBMSM's social health. For example, rather than shrinking social spaces where YBMSM can gather and develop healthy relationships, it should be a public health agenda to make those spaces more readily available thereby thwarting encroaching perceptions of social isolation and invisibility in their communities. Traditional spaces for social convening such as libraries, recreation centers, parks, and even social and dance clubs need to be protected as important places that erect strong social capacities in marginalized communities. As the results of

this study suggest that larger emotional social support networks do not necessarily reduce loneliness, community-based and other service organizations for this population need to engage assessment of the social well-being of their clients and utilize opportunities beyond one-on-one case management to address feelings of perceived social isolation. Providers may assume in error that mobilizing social support or hosting large gatherings is sufficient to address the social isolation of YBMSM. Assessment, monitoring, and facilitating meaningful connections should be essential components of their service delivery. There is also a need to expand the capacity of peer interventions and network interventions to pay special attention to the issues of social disconnection and loneliness as lonelier YBMSM may not benefit in the same way as the non-lonely.

Informing the HIV epidemic experienced among YBMSM, community members and interventionist should consider that HIV/STI transmission through sexual risk behaviors may well reflect YBMSM efforts to meet basic social needs and counter experiences of social rejection, stigmatization, and alienation; thus preventing HIV/STI transmission as well as efforts at promoting access to and engagement in healthcare needs a more social orientation and more generous contextualization that extends beyond an individualist approach. Hence, there should be development of healthy relationship (outside of sexual intimacy) and social connection interventions that help YBMSM to both express and satisfy those needs more safely, especially in a cultural context in which technological innovations and deep political polarization threaten the formation of those bonds.

Finally, this project finds an optimistic tone by identifying that close attachment to Black and gay communities can promote a resilience that counters loneliness. Moreover, in the efforts related to eliminating new HIV infections, community mobilization efforts that rally individuals who share those identities should remain central to engagement efforts as they not only exemplify a collective energy that promotes effective solutions, but also potentially serve to improve the social well-being of YBMSM and consequently improve health outcomes. From this perspective, the community itself is found to be an answer to its own problem (of loneliness). One of the most critical insights from this study is an appreciation for how the need for belongingness underlying feelings of loneliness is at core provides an opportunity to create meaningfulness in life through the relationship with others.

Epilogue

> "As a form of negative affect, loneliness shores up the alienation, isolation and pathologization of black gay men…. But loneliness is also a form of bodily desire, a yearning for an attachment to the social and for a future beyond the forces that create one's alienation and isolation."-Darius Bost, Loneliness: Black Gay Longing in the Work of Essex Hemphill (p.355) [19].

There appears to be a consciousness arising concerning the health impacts of loneliness reflected globally by the United Kingdom's appointment of a Minister of Loneliness [20]; as a significant health matter in the United States captured in the Surgeon General's warning of an "epidemic of loneliness" [21]; and an increasing number of news reports in the commons warning of increasing loneliness in society and its health impacts among young adults as much as, if not more than, older adults. The findings of this dissertation represent a scientific progression toward to be future investigations about the health impacts of loneliness, especially among BMSM—largely absent from the research literature beyond its association with their sexual risk behavior.

From this author's perspective, attention to the distressing experience of loneliness among BMSM not only holds potential relevance to the pressing health challenge of disproportionate HIV transmission rates in BMSM communities, but more significantly highlights a valued approach concerning their existential well-being that for some seems

underappreciated in public health and other discourses pertaining to the makings of well-being for the bodies of Black gay and other identified MSM. For when the social problem of loneliness is turned inside out, it reveals a common, uniting desire and longing shared with all humanity for connection, intimacy, and belonging—basic needs that too often get obstructed by socio-cultural and structural barriers to their humanity.

From the vantage point of this author who identifies as a Black gay man and has encountered several of the complex social forces that buffet our optimal health and well-being, raising critical questions as to the interior social lives of BMSM, especially those suffering this vulnerability in their youth, is deemed a worthy pursuit toward *heal*ing which should be afforded in public *heal*th strategies. Moreover, it is hoped that identifying and addressing the barriers to healthier social relations could prove essential to the pursuit of social justice and health equity for other populations as well.

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CURRICULUM VITAE

Bradley, Cory D.

Curriculum Vita
Cory D. Bradley
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Academic Preparation

Doctoral Candidate, anticipated graduation 2019
Health, Behavior and Society, Johns Hopkins Bloomberg School of Public Health
Baltimore, MD
Dissertation Title: Characterizing the experience of loneliness among a Chicago cohort of young black MSM

Master of Social Work (MSW), 2014
College of Social Work, University of South Carolina; Columbia, SC
Organizations and Communities Concentration

Master of Public Health (MPH), 2014
Arnold School of Public Health, University of South Carolina; Columbia, SC
Health Promotion, Education & Behavior Concentration

Baccalaureate, 2001
Psychology B.S. degree/Neuroscience Minor, Morehouse College; Atlanta, GA
Phi Beta Kappa, Summa cum laude

Professional Experience

Adjunct Faculty, Community College of Baltimore County, Baltimore, MD; October 2018- supporting students through their transition into community college, acquisition of skills for successfully completing the associates degree and continuing to a four-year institution.

Graduate Research Assistant, Johns Hopkins Bloomberg School of Public Health (BSPH) Office of Public Health Practice and Community Engagement), Baltimore, MD; May 2018 - August 2018

- Feasibility Assessment/Study of opportunities for strengthening collaborative relationships with Baltimore City local HBCUs toward promoting health equity in Baltimore City
- Conducted interviews, analysis of documents, and development of culminating report of findings
- Supervised by Vice Dean Joshua M. Sharfstein, MD joshua.sharfstein@jhu.edu

Field Placement Supervisor; BESURE; BSPH, Baltimore, MD; May 2016 – October 2017

- BESURE (National Behavioral Surveillance Study) is a community health project based in Baltimore funded by the U.S. Centers for Disease Control & Prevention that measures prevalence of HIV, health and social issues, health-related behaviors and access to services among key groups in Baltimore
- Supervised and conducted recruitment of and interviews with participants from key vulnerable and marginalized groups; oversight of compliance with CDC protocols for operational procedures and conduct of ethical research
- Contributed to the development and manuscript of the formative assessment submitted to the CDC
- CRT certified by Maryland State Department of Health; conducted HIV testing and delivered results and provided counseling for participants
- Supervised by Antoine Tomlin antionetomlin@gmail.com

Graduate Research Assistant, Project Coordinator for the Social Networks, Social Resources and HIV Transmission Study; BSPH, Baltimore, MD; May 2016 – October 2017

- Supported PI in the development of research program for the NIH-funded grant
- Developed initial design of socio-behavioral survey for study; literature search and analysis culminating in review of a compendium of measures for inclusion in the survey
- Developed and implemented focus groups and related protocols
- Provided guidance to undergraduate summer intern in developing socio-behavioral survey
- Conducted data analysis and submitted findings for presentation at the American Public Health Association Conference (Social context of sex exchange participation among men who have sex with men)
- Supervised by PI, Dr. Danielle German danielle.german@jhu.edu

HRSA Trainee Fellow 2015, BSPH, Baltimore, MD; May 2015 - August 2015

- Assisted in the development of faith-based collaboration utilizing principles/methodology of community-based participatory research and engagement to help African American faith communities increase knowledge and use of advanced directives in palliative care
- Meetings with pastors and congregational leaders
- Designed and implemented conference for faith-based community regarding advanced directives and health inequity and the role of church ministries in addressing related health disparities in health service use
- Supervised by Dr. Amy Knowlton aknowlt1@jhu.edu

Graduate Research Assistant, University of North Carolina School of Social Work, Charlotte, NC; January- May 2014

- Study focused on the development and implementation of a web-based, online HIV prevention intervention led by Young Black MSM & TransWomen (18-30) in North and South Carolina some of which are involved in the House-Ball community.
- Implemented data management processes and protocols

- Performed literature searches
- Supported the project coordinator to enhance usability and engagement of online intervention
- Implemented CBPR strategies
- Manuscript development
- Supervised by Dr. Diana Rowan drowan@uncc.edu

Graduate Social Work Field Placement at Trinity House: Mind, Body & Spirit Inc., Charlotte, NC; August 2013-June 2014

- Grassroots organization providing HIV prevention, education and holistic care services to people living with HIV and the affected community, specializing in collaborating with African American faith communities
- Planned and facilitated team-based program planning; directly responsible for development of advocacy program and capacity building efforts with local churches
- Supported the development of the strategic vision, mission statement and business plan
- Provided research support to identify evidence based practices for targeted population health interventions
- Conducted need assessment to identify gaps in service and community readiness
- Supported the executive director in developing collaborative relationships with community partners
- Supervised by Geneva Galloway genevagalloway50@yahoo.com and Susan Vail, ACSW smckvail@aol.com and Dr. Suzan Boyd (sboyd@uncc.edu)

Grant Evaluator for Mecklenburg County Ryan White Program (Part A Ryan White Services Grant Applications); Charlotte, NC; April 2013 - May 2013

Graduate Social Work Field Placement, RAIN (Regional AIDS Interfaith Network), Charlotte, NC; August 2011- May 2012

- Performed client intake and psychosocial assessments, including goal development for HIV positive clients
- Provided individual counseling to HIV positive clients
- Facilitated HIV/AIDS educational awareness at community events
- Planned, coordinated, and facilitated meetings/events with clergy from faith-based organizations participating in a federally funded grant by Department of Health and Human Services Office on Women's Health)
- Organized and coordinated city-wide community HIV/AIDS awareness event in observation of the National Week of Prayer for the Healing of AIDS in Charlotte
- Provided case management services to HIV positive clients

Worship Pastor (Director of Worship Arts Ministries) New Birth-Charlotte, Charlotte, NC; April 2003 - June 2014, 3,000+ size ministry

- Licensed Minister

- Oversight of the administration, recruitment and creative talent development of volunteers
- Provided pastoral care and counseling to congregants; including group counseling
- Managed the work and efforts of coordinator within the creative ministries of the church and supported the development of their creative and leadership capacities
- Planned worship gatherings and coordinated creative performances and productions in the ministry
- Wrote and directed productions and designed special artistic presentations and productions
- Collaborated with colleagues in infrastructure development and expansion of the ministry's strategic planning and implementation
- Engaged and facilitated activities related to conducting rehearsals, preaching and teaching activities, workshops on local, national and international platforms
- Acted in capacity of pastor's liaison to special interest community projects and provided strategic direction for community engagement on behalf of the ministry
- Initiated and provided oversight of the ministry's capacity related to efforts addressing HIV/AIDS. Assisted in organization and coordination of church's participation in related community services and projects

Publication

Rodriguez-Hart, C., **Bradley, C.,** German, D., Musci, R., Orazulike, I., Baral, S. Et al. (2018). The synergistic impact of sexual stigma and psychosocial well-being on HIV testing: A mixed-methods study among Nigerian men who have sex with men. *AIDS & Behavior*.

Poster

Rodriguez-Hart, C., **Bradley, C.,** German, D., Orazulike, I., Kayode, B., Liu, H. et al. (2017) The value of building social networks among Nigerian men who have sex with men (MSM) affected by sexual stigma: A qualitative study of barriers and benefits. International AIDS Conference on HIV Science 2017.

Presentations

Panelist for the Maryland HIV PrEP Summit; Discussion centered on best practices for outreach, community engagement and marketing. (September 2018). Baltimore, Maryland.

Bradley, C. (March 2018). "Supporting the Health Journey in Collegiate Learning Communities: A Perspective of Inclusion, Diversity and Building Human Capacity" *Southern College Health Association Conference 2018* in Columbia, SC. (Keynote Address)

Bradley, C. (March 2017). "Enhancing Access to the Health Journey: Developing Inclusion, Diversity and Human Capacity in Collegiate Learning Communities." *University of South Carolina Healthy Campus Summit* in Columbia, SC. (Keynote Address)

Williams, D.R., Trent, M. E., LaVeist, T. & **Bradley, C.** (April 2016). Panelist on the Racism and Health Panel of the conference themed "Race, Racism and Baltimore's Future: A Focus on Structural and Institutional Racism." of the Urban Health Institute 2016 Social Determinants of Health Symposium in Baltimore, MD. (Panelist)

Bradley, C. (March 2016). Webinar Presentation "Considerations on Moving from Resilience to Resistance" in the Counter Narrative Project webinar entitled "Beyond the Clinical Narrative: Black Gay Men and Barriers to Care."

Community and Leadership Activities

Member of the Community-University Coordinating Council with the responsibility of providing ongoing input to the work of the Johns Hopkins Urban Health Institute to enhance community and university dialogue around critically important health and human development related issues in the city of Baltimore.

Member of the Governing Board for the Student Outreach Resource Center (SOURCE) which is a community engagement and service learning center for the Johns Hopkins University Schools of Public Health, Nursing, and Medicine.

Founding member and organizer of Black Men Loving Black Men, a grass-roots, community-driven collective of Black gay men in the city of Baltimore whose efforts are rooted in addressing concerns of social isolation, loneliness and social disconnection disrupting the health and well-being of Black gay men in Baltimore.

Executive leadership team of **S**tudents for a **P**ositive **A**cademic pa**R**tnership with the East Baltimore **C**ommunity-student initiated action group that emerged by post-Freddy Gray homicide and the citywide response of protests and civic disobedience. The group forged a renewed examination and response of JHU BSPH to our local community's concerns, priorities, and efforts to achieve equity. In collaboration with faculty and the student body, we crafted and reinvigorated the "Engage Baltimore" focus along with several other projects to integrate community perspectives within our practices, policies and strategies.

ViiV Healthcare ACCELERATE! Community Advisory Board wherein my role is advising the strategic direction of ViiV Healthcare's four-year, $10 million commitment to support innovative projects focused on improving HIV outcomes for Black gay men in Baltimore Maryland and Jackson, Mississippi.